



FRIDAY, JULY 29.

### Construction of Brakes for Freight Cars.

The following report was presented at the recent convention of the Master Car-Builders' Association in New York: To the President and Members of the Master Car-Builders' Association:

Your Committee, to whom was referred the subject to investigate and report whether it is desirable and economical to apply brakes to all the wheels of freight cars, and the best way of bringing about uniformity in their construction and to recommend forms and proportions for standards for those parts of brakes which require most frequent renewals, would respectively beg leave to submit the following:

From the 500 circulars which were sent out, 60 replies have been received, which, taken as a whole, give results as follows:

- 46 roads use 4 shoes on an 8 car.
- 14 roads use 8 shoes on an 8 car.
- 32 roads recommend 4 shoes on an 8 car.
- 28 roads recommend 8 shoes on an 8 car.
- 54 use the head and shoe separate.
- 6 have the head and shoe in one piece.
- 18 roads use cast and wrought-iron combined.
- 38 roads use cast-iron shoes.
- 4 roads use cast and wrought-iron shoes.

That the master car-builders are interested in this subject is evident from the replies that have been received. A number of car-builders have written us letters on the subject, some of which will be read. With one or two exceptions all have expressed themselves in favor of uniformity, and of having some standard adopted by the convention. It is, perhaps, useless for your committee to tell you that there are almost as many kinds of brake-heads and shoes in use as there are roads, but it may be well for us to tell you, that we find that roads that use the same kind, have made their patterns different, so that they will not interchange. We are sorry to say to you that we have not been able to present to you, out of the many kinds that are now in use, a standard that we thought would be favorably received by you, without coming in contact with a patent. We would, therefore, invite a further expression of opinion from the members of the convention in regard to the best kind to be adopted.

In regard to placing the brakes upon all the wheels of freight cars, we have made several experiments in relation to it, and are satisfied that, when applied to all the wheels will stop the car much quicker, and that the brakeman is not obliged to apply the brakes to as many cars to stop the train as he would if only applied to four wheels. With the same power applied where there are brakes on all the wheels, as where there are on four a larger amount of friction is obtained and yet does not slide the wheels, therefore bringing the train (in a shorter space of time) to a stop. We are satisfied that there is a very large per cent. less of flat wheels where brakes are applied to all the wheels, and would strongly recommend applying them to all the wheels of freight cars.

J. W. MARDEN,  
S. A. DAVIS,  
Committee.

### DISCUSSION.

Mr. MARDEN said that over 50 patterns had been presented to the Committee, and they had found it a very difficult matter to present any standard brake-head and shoe.

Mr. ADAMS said that the main obstacle to the recommendation of a standard seemed to be that the brake-shoes were patented. He thought that ought hardly to be an obstacle. A great many of the appliances they used were patented, and in this case the royalties could not be very large. If there was a brake-shoe that could fairly be recommended the royalty ought not to stand in the way. They wanted a uniform standard in this matter and should not hesitate to adopt a good shoe because of a patent. The great difficulty they had with brake-shoes was the multiplicity of patterns, so that they had to keep a large number in stock to make repairs, at a great expense.

Mr. MARDEN said that the Committee understood that they could not recommend a patented device, and had kept that in view. Nearly half the roads answering the circular used a brake-head with a long key running down and holding the shoe. That device was covered by a patent.

Mr. KIRBY had always advocated applying brakes to all the wheels of a car. He had seen wheels cut in running 200 miles. The cost of the extra fittings would soon be saved in the wheels. It might cost a little more at first to put brakes on all the wheels, but there would be a saving in the end in saving the wheels. Then again, as the committee said, it would not be necessary to put the brakes on so many cars to stop a train, and that would help the brakemen.

The PRESIDENT said that there was a misapprehension as to patents. The constitution provided that no patents should be allowed to advocate their claims at the conventions of the Association. He did not think that it excluded discussion of the merits of patents by members.

Mr. DAVENPORT said that one of the chief objects of the Association was to exchange information and discuss improvements in car-building. They could hardly do this properly without some discussion of patents.

The PRESIDENT suggested that if brakes on four wheels were enough for a car with 10 ton loads, brakes might be needed on all the wheels when the load was 20 tons.

Mr. HOPKINS said that he had observed that a car-wheel which had a flat place or was not quite round tended to become round much more when brakes were applied to it than when brakes were not used on it. He had seen flat places made by sliding a wheel afterward corrected by the friction of the brakes.

Mr. McWOOD thought the value of the Committee's work much lessened if they were not allowed to recommend some kind of brake. They needed uniformity and many of them were ready to adopt a standard. It was important to reach a decision soon, because a very large number of new cars were now building or soon to be built. The difference in brake-shoes after all was not very great, but enough to prevent uniformity, and make trouble in repairing foreign cars. It was important that a standard should be set up, and he believed that it would be generally adopted.

Mr. MARDEN said that the Committee would have prepared a very different report if they had believed that they had the right to recommend a patented article. As to putting brakes on all the wheels, on his road the Superintendent and Engineer had strongly recommended it, both on account of the saving of wheels and for the advantage given the brakemen in stopping a train quickly.

Mr. ADAMS offered a resolution recommending the adoption of what is known as the Frederick brake-shoe, and the preparation of drawings of the same by the committee.

Mr. ADAMS believed that the royalty for the use of this brake-shoe would be very small.

Mr. DAVENPORT thought that when any patented article was recommended the cost should be ascertained and clearly set forth.

Mr. STEWART said that if anything was adopted without a positive price, shippers would take advantage of it.

Mr. ADAMS said that patentees might ask an exorbitant price, but they would generally accept a reasonable offer at last.

Mr. DAVENPORT thought that the recommendation of the Association would be of very great value to an inventor, and they ought to require some concession in return.

Mr. HOPKINS agreed that they ought not to recommend any patented article unless the owners of the patent were willing to accept a moderate royalty.

Mr. BISSELL said that most companies were unwilling to pay anything at all for a patent.

Mr. ADAMS said they were willing to pay a reasonable price, but not to be tied.

Mr. ORTON did not believe that it would be prudent to vote on any patented shoe then. On his road they had used a patent, but were going back again to the solid shoes. They believed they were the most reliable after all.

Mr. HACKETT had used the solid shoe, but had had to give it up.

After a little further discussion as to the advisability of adopting patented devices, the subject was referred back to the Committee with instructions to have drawings prepared of such brake-shoes as they might think best, and, if patented, to communicate with the patentees and get definite statements as to cost and royalties to be charged.

### The Effects of Heavy Car-Loads.

At the recent convention of the Master Car-Builders' Association, the following question was submitted for discussion by Mr. C. A. Smith:

"What has been the effect of the use of cars of 20 tons capacity upon car-bodies, wheels, journals, journal-bearings and axles?"

Mr. SMITH said that his object was to ascertain what had been the experience with cars carrying 20 tons. A few years ago not more than 10 tons load was allowed to a car; now 20 tons are carried, and he would like to know if any bad results had followed. The next move would be 25 tons, and they could carry that as well as 20 tons.

Mr. C. E. GAREY said the only objection he had to the heavy loads was as to the braking capacity. With 20 tons load they would need brakes on all the wheels.

Mr. SMITH thought that objection would soon be obviated by the introduction of train brakes.

Mr. HODGE had been using cars of 20 tons capacity and had found no trouble as to braking capacity. They had 3,500 such cars and had had no trouble with them.

The PRESIDENT asked whether the wheels were heavy enough for 20 ton cars; the car-body also, the axles, couplings, etc.

Mr. COULTER said that they had many cars marked to carry 16 tons, and the load was often 20 tons really. They gave no special trouble.

Mr. DAVENPORT said that he had heard of an important trunk line which was seriously contemplating the use of cars to carry 30 tons. The question of building such cars was new to him, but the improvements in permanent way had made it possible to carry very heavy loads.

Mr. SMITH said that years ago the old style cars with small journals had often carried 15 and 20 tons safely. Now with stronger cars, heavier axles and better tracks they only took 20 tons. Years ago he had advocated increasing the load of coal cars from 10 to 15 tons, but could only get leave to make it 12½ tons. Now much heavier rails and bridges were in use. A road which could carry the large engines now in use could carry 20-ton cars with ease, and they ought to be made fit to carry that load. It was only a matter of a few years when 30 tons would be the load.

A MEMBER said they had cars to carry 20 tons, and they were often loaded up to 25 tons. They had weighed one car with 32 tons in it.

Mr. FORNEY said that he had been laughed at for advocating large journals, but they had now become necessary.

Mr. DAVENPORT said that they were then discussing what was necessary to carry 10 tons load. He had advocated the 3½ by 7 in. journal and still believed that ample for 10 tons, but when you came to carry 30 tons it was another matter. This matter of loads and freight transportation had run away with them and no one could tell what was coming next. His advice had been asked by a railroad manager as to carrying 20 tons load, and he had said that 20 tons was being actually carried. He had not thought it safe, but now they saw it actually done. Many of them could remember when they had about 45 lbs. iron rails and carried 10 tons on a 3 by 5½ in. journal, and then they often found 15 tons in a car when it was weighed. Now with heavy steel rails, heavy cars, large journals and axles and everything in proportion, it took a man of nerve to say what cannot be carried. They were making up their minds to follow the lead of the man who would build a car to carry 30 tons.

The PRESIDENT said that some wheel-maker had remarked to him that the present wheels were not heavy enough for 20 tons load.

Mr. DAVENPORT hoped to hear from some of the wheelmen. After all, the wheel was the part which came in contact with the track and had to bear the load and all the shocks and blows of bad joints and everything of the kind. They had been told of the wonderful wheels they used to have in old times when they carried six or eight tons and broke more wheels than they do now. The old wheels would not stand the strain put on wheels now. Not only was the load doubled, but a car now made twice the mileage that it formerly did. Speed of freight trains had been increased also, and that was as hard on wheels as anything else, indeed the greater speed tried the wheel more than the heavier load. The wheel-makers, he believed, were trying hard to improve the quality of the wheels and to keep up with the rest.

The discussion was then closed.

### Who Controls Rates?

It is popularly supposed that the presidents of the several railroads control the rates of their roads in the last resort, either individually or in the associations in which they agree upon rates, such as the Joint Executive Committee. It appears, however, from the following report of an interview with Mr. Albert Fink, published in the *Produce Exchange Bulletin* of last week, that the organization of the commercial service under them is so loose that a vast number of their subordinates actually control rates, and that when they have violated orders concerning them the fault cannot be traced to the guilty party.

### COMMISSIONER FINK'S REMARKS.

To our reporter Mr. Fink said: "The methods that are often being used by railroads to secure business are the

making of secret agreements with shippers, for reduced rates, with a view to deceive and secure advantages over their competitors. This sort of process is generally called competition, but I don't think it is entitled to that name. It is a mere cheating process, and should not be practiced by honorable men. When the officers of railroad companies come together and agree upon a joint tariff, each company should strictly adhere to it; but during a long war between railroad companies there has been engendered such a feeling of distrust that no company has confidence in the assurance of the other to deal honestly and straightforwardly with it. The fact is that under the present organization of the commercial business of railroad companies, no one company can give an assurance to carry out its agreement, as there are hundreds and hundreds of agents employed in whose power it is to destroy the revenue of the railroads, as they are not under the control of any one responsible person. This organization is got up for the purpose of competition and fight, and no better system could be devised to ruin the revenues of the roads and to bring about just such wars as are now being waged with the property of the innocent stockholders of the railroads. The presidents of the trunk lines cannot control these organizations, and hence we find that so many agreements these presidents have made are disregarded and not carried out. There is no more tallacious idea in the minds of the people than that the presidents of the trunk lines or the chief railroad officers of the railroads control the railroad property. They have practically nothing to do with it. It is utterly impossible to determine to-day who is responsible for the present unfortunate war between these companies. I have no doubt that all railroad managers in good faith desire to avoid such a state of affairs as now exist; yet the methods and systems that have been in vogue so long in dealing with the tariff questions are so imperfect that it is utterly impossible for them to control the most important branch of railroad management, viz.: the maintenance of equitable and fair tariffs, fairly remunerative to railroad companies and just and reasonable to the public; tariffs that can be permanently maintained, under which each shipper may know exactly what he has to pay and that he does not pay any more than his competitor in the business. The steps that have been taken for the last four years by the railroad companies under the organizations called the "Joint Executive Committee," and "Trunk Line Committee," were for the purpose of remedying these evils and of getting the control of the tariff in the hands of the general managers. One of the means to accomplish this is the agreement between competing lines to cease underbidding and cheating each other in consideration of determining between themselves the relative proportion of tonnage which each should carry, and to maintain the tariff alike to all parties for similar services. It is on account of the failure to agree upon such a basis of transacting business, each company claiming more than its competitor concedes, that the present war has arisen. While thus contending for a few hundred tons of freight, the total revenues of the roads are decreased by millions, and all the evils of unjust discrimination and of fluctuating rates follow as a consequence. All commercial transactions become speculative and uncertain on account of the fluctuations of transportation rates. First-class passengers are now being carried to Chicago for ten dollars, in first-class passenger cars, while poor emigrants are paying thirteen dollars for the poorest passenger accommodation. All this is wrong, and is a discredit to the railroad management of the country. When one desires to fix the responsibility for such unjust discrimination, it is impossible to point out the party who really is responsible. They are all responsible in a measure for failing to co-operate with each other. No one railroad manager, nor any number of them, can bring about reforms except they are all agreed. While it thus requires the agreement of at least the principal managers of the railroads in this country to conduct the business in a business-like, sensible manner, yet it is in the power of a single manager, even of an unimportant road—yes, even of a bankrupt road—to destroy the value of the railroad property of the whole country, or of a great portion of the country, and to bring about such a state of affairs as now exists, ruinous to the interests of the railroad companies and unsatisfactory to the shippers, and therefore detrimental to the best interests of the country."

Reporter: "What are the particular disadvantages to the public of the present war of rates?"

Mr. Fink: "You hear at the present time complaints from all quarters. The shippers at Indianapolis, for instance, complain that they do not know whether the present tariff rates are proportionately as low from Indianapolis as from Chicago. Each shipper does not know whether his neighbor and competitor in the business has any lower rate than himself. There is great uncertainty in the minds of the people who have to invest money in commercial transactions how to operate for the future. The rates may be raised again tomorrow or the next day. All these difficulties are avoided by the railroad companies being obliged to adhere to the published tariffs officially promulgated from time to time and which are so arranged and adjusted from the different localities as to stand in a proper proportion of the relative distances of these localities from the markets. During the last four years this has been accomplished to a great degree by the association of the trunk lines on west-bound freight, and for the last two years on east-bound business, through the Joint Executive Committee of Eastern and West in roads. The advantages of this system of controlling tariffs have been so great, both to the railroad companies and the public, that I believe it is impossible for the present unsatisfactory state of affairs to continue for a long time. If it were to continue for any length of time, a good many of the roads would pass into the hands of receivers. Past experience having now established the fact that the tariff question can be controlled, railroad managers will be obliged to adopt the proper methods necessary for that purpose. The public and the shippers have, to some extent, looked upon the organization and co-operation of railroad companies as inimical to the public interests; the fact is that these are absolutely necessary to manage the roads in the interest of the people. Even the Chamber of Commerce of this city has gone so far as to petition Congress to prevent the combinations of railroads for that purpose, of course under a misapprehension of the real intentions and effects of these combinations, and the present difficulties may have the good result to demonstrate to the public the great advantages that for the last few years have been conferred upon the public by these associated roads. It is the only practical method by which the railroad problem can be solved. There is no more fallacious idea than that by these combinations unreasonable high rates could be enacted. Railroad tariffs are completely controlled by water competition and other commercial laws that make this impossible. The only difficulty so far in carrying out permanently the system of co-operation is that it requires the voluntary consent of railroad companies, instead of its being enforced upon them by legal enactments. When the people understand the subject better they will insist, either by the force of public opinion or through legal enactments, to compel railroad managers to work the railroads of this country in harmony with each other, and prevent selfish railroad companies, in endeavoring to gain some advantage over each other, to stand in the way of the proper management of roads in the interests of the public."



### Foster's System of Lighting Railroad Cars by Compressed Gas.

The cheapness of petroleum and the ease with which it can be vaporized, or converted into a gaseous form, have led to many attempts to use it for the production of illuminating gas. Although some measure of success has attended even the rudest efforts of this kind, yet the great difficulty has been to produce a *fixed gas*, or one which would not smoke nor condense and thus deposit tar and other obstructions in the apparatus used, and at the same time keep the latter so simple that a person of ordinary intelligence could manage it.

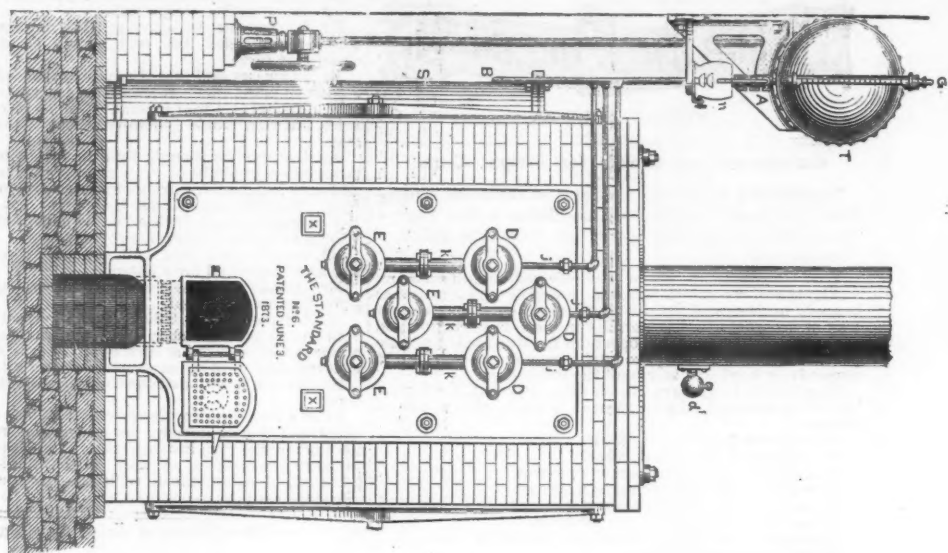
To those who are not familiar with the process of converting petroleum into gas it may be said that if in the process of conversion too low a degree of heat is used, some portions of the gas produced will be readily condensed and a deposit of coal tar and other substances will thus occur. In other words, a certain high degree of heat must be employed to make the gas non-condensable under the ordinary circumstances of its use. On the other hand, if the temperature is too high, the carbon in the petroleum will be deposited in the retorts in a solid form, thus leading speedily to their destruction. Success in the production of petroleum gas is therefore dependent on the regulation of the temperature during the process of gasification. This is difficult to do, for the reason that if liquid petroleum is injected into a hot retort and converted into gas it will absorb an enormous amount of heat in the process of changing from the liquid to a gaseous state. This principle is illustrated in the boiling of water. Under atmospheric pressure water boils at 212°, and the temperature of steam at the same pressure is also 212°. It is, therefore, often thought that to convert water into steam under those conditions all that is required is to heat it to that temperature. But when this has been done we have simply water boiling hot. To convert it into steam we must continue to add more heat, which in the old phraseology was said to become "latent." The quantity of heat contained in a pound of boiling water is 212 units, whereas a pound of steam of atmospheric pressure has 1,178.1 units. In other words, the amount of heat required to convert a pound of boiling water into steam is 1,178.1—212 = 966.1 units, which has been called "the heat of gasification." The conversion of petroleum, or any other substance, into gas, is attended with exactly similar phenomena, that is, an enormous amount of heat is absorbed in gasifying it. To maintain the requisite temperature in the retorts, therefore, they must be heated very hot, which either produces a deposit of solid carbon in the inside, thus impairing their efficiency, or they are rapidly destroyed by the great heat. On the other hand, as already explained, if the retorts are not kept hot enough the product will not be a fixed gas, but will condense and deposit tar in the apparatus.

In this dilemma the resort has usually been to the use of retorts at so low a heat as to be incapable of making a fixed gas, and to use a quantity of air or non-luminous gas to carry the imperfect products to the place of consumption—a practice resulting in great waste, and, although the effect of a very small quantity of air in very rich gas may not be noticed, the admixture of large quantities rapidly destroys the lighting power. So great is this destruction that 1,000 ft. of oil gas, which is capable of giving as much light as 200 pounds of sperm candles, when mixed with 1,000 ft. of air, forming 2,000 ft. of so-called "mixed gas," will give only as much light as 100 pounds of sperm. This is of great importance if gas must be compressed and stored in a portable holder, as it must be for lighting railroad cars, for the volume which must be stored and carried is in inverse proportion to the illuminating power of the gas.

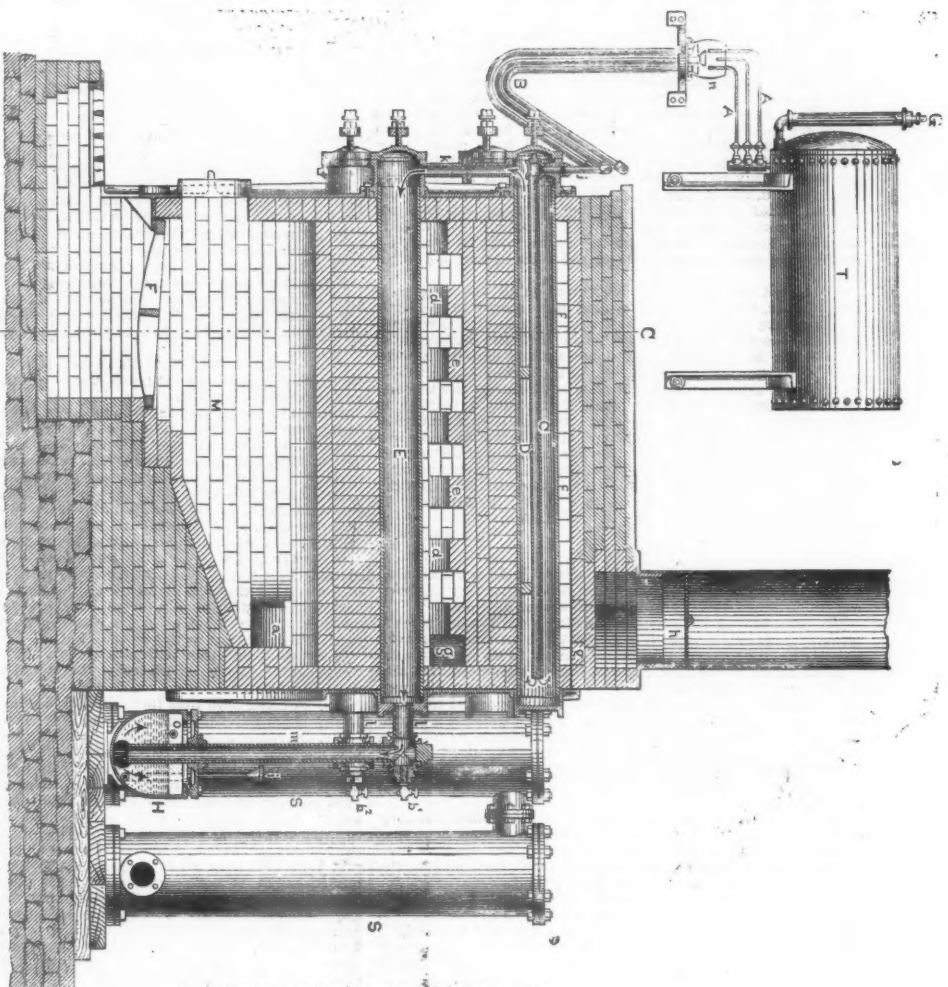
In the manufacture of petroleum gas, then, the temperature should be regulated so that it will not be high enough to destroy the retorts rapidly or cause the carbon in them to solidify, and yet the heat should be sufficient to produce a fixed gas with a high illuminating power.

This is accomplished in the Foster apparatus by a system of what are called "protected retorts," illustrated in figs. 1, 2 and 3. Fig. 1 is a front elevation, fig. 2 a longitudinal section, and fig. 3 a transverse section of the furnace and retorts. The latter consist of cylindrical wrought-iron tubes *C C C*, *D D D* and *E E E* arranged in two groups, of three each, one group above the other, as shown in the engraving, and set in brick work with a grate *F* and furnace *M* underneath. The products of combustion from the fire in the grate *F* pass to the back part of the furnace and then pass out through two flues *a a* on the sides, represented by dotted lines in fig. 3, and into the longitudinal flues *b b*. These are covered with thin fire-bricks *c c*, which are laid with narrow spaces between them, so that the hot air and gases can pass between them upward into the chamber *d d* containing the lower group of retorts *E E E*. This chamber is covered by the arched tile *e e*, which are laid some distance apart, as shown in fig. 2; and therefore the air and gases can pass freely from it to the upper chamber *f f* containing the other group of retorts *D D D*. The flues *g g*, shown by dotted lines, by which the products of combustion are carried to the chimney *h*, are connected with the back part and on the sides of the chamber *d d*; consequently only a portion of the heat from this chamber ascends into *f f*. It will be seen that by this arrangement the lower retorts *E E E* are exposed to a much higher temperature than the upper group *D D D*. It will be seen, too, that the upper retorts have each an inside tube *C*, extending nearly their entire length. The oil to be converted into gas is admitted by the pipes *j j j* into these inner retorts *C C C*, through which it flows to the back end, as indicated by the darts, and then escapes into the outer retorts *D D D* and passes back again to the front end, and from there downward through the pipes *k k k* into the lower retorts *E E E*.

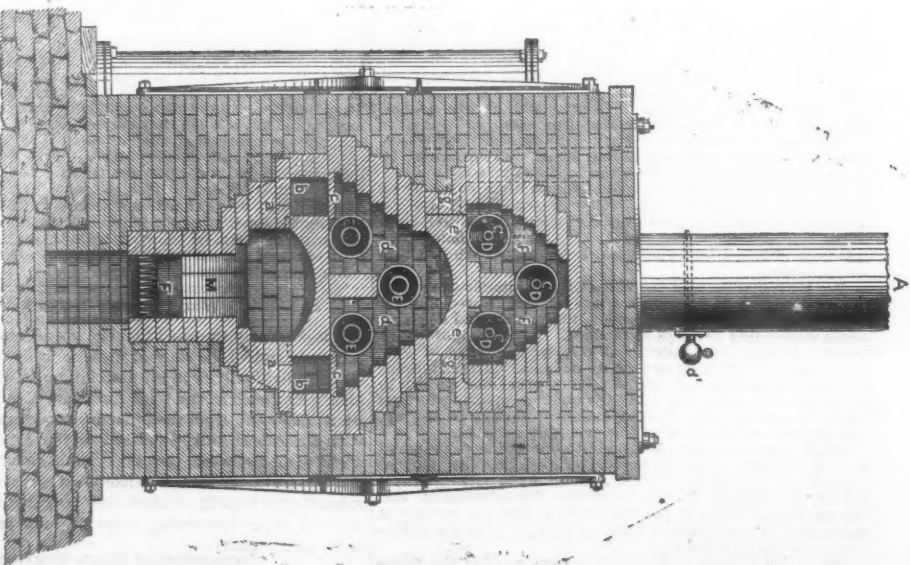
FIG. 1.  
FRONT ELEVATION.



SECTION A B.  
FIG. 2.  
THE FOSTER GAS MACHINE.



SECTION C D.  
FIG. 3.





and through them to the rear end, and then escapes through the pipes *l* and *m* into the hydraulic *H*.

It will be seen that with this arrangement the oil enters first into the inner retorts *C C C*, where it is exposed to a comparatively low temperature, and then into *D D D*, which are somewhat hotter, and finally into *E E E*, which are nearest to the fire and are consequently exposed to the greatest heat. The oil is thus vaporized in the upper retorts at a comparatively low temperature, and is converted into a permanent gas in the lower ones, where it is exposed to the degree of heat required to effect that purpose. As the oil is already vaporized or partly gasified when it reaches the lower retorts, only a small quantity of heat—that is, measured by units—need be added to it to convert it into a permanent gas; consequently, the lower retorts need be very little hotter than the heat required to make a permanent gas. As already explained, if the whole process of converting the liquid oil into a permanent gas is carried on in the

producing gas of higher illuminating power, which will not deposit any tarry or other liquid substances when compressed, than any other process in use.

When gas is used for lighting railroad cars, it is of course necessary to compress it, so that it can be carried in a reservoir of such dimensions as will admit of convenient transportation in ordinary cars. To do this Mr. Foster has designed what he calls a compound gas compressor, represented by figs. 4, 5 and 6. This consists of a compound pump, shown in fig. 5 and in section in fig. 6, which is driven by a vertical steam cylinder, 7 in. bore by 18 in. stroke shown in fig. 4—both pump and engine being attached to the same frame, as shown.

Two great difficulties attend the compression of gas or air, especially under a high pressure. These are:

First, the development of "latent" into sensible heat, which necessarily results from compression. In other words, the temperature of air or gas is elevated by compressing it,

half of the horizontal scale. The pump consists of two cylinders. The lower or larger one *B B* is  $4\frac{1}{4}$  in. in diameter and is stationary. The upper one is  $2\frac{1}{4}$  in. in diameter, and is attached to the piston *K K*, which works in the lower cylinder. This piston is worked from the cross-head *P P*, as shown in fig. 5. The gas is introduced into the pump by the lower inlet pipe *Z*, and, passing the winged valve *A*, into the cylinder *B*, is, on the downward stroke of the large piston, forced through the valve *C* into the smaller cylinder *D*, thus first compressing the gas with the large piston to five atmospheres. On the upward stroke of the pump the gas in the cylinder *D* is discharged by the pressure of the small piston *E*, through the valve *F* into the cylinder *G*, which is connected with the gas receiver. By this arrangement the strain on the machine and the consequent friction inevitably resulting from a high pressure of gas exerted upon a large piston are avoided, and the friction is reduced, not merely by the diminished pressure

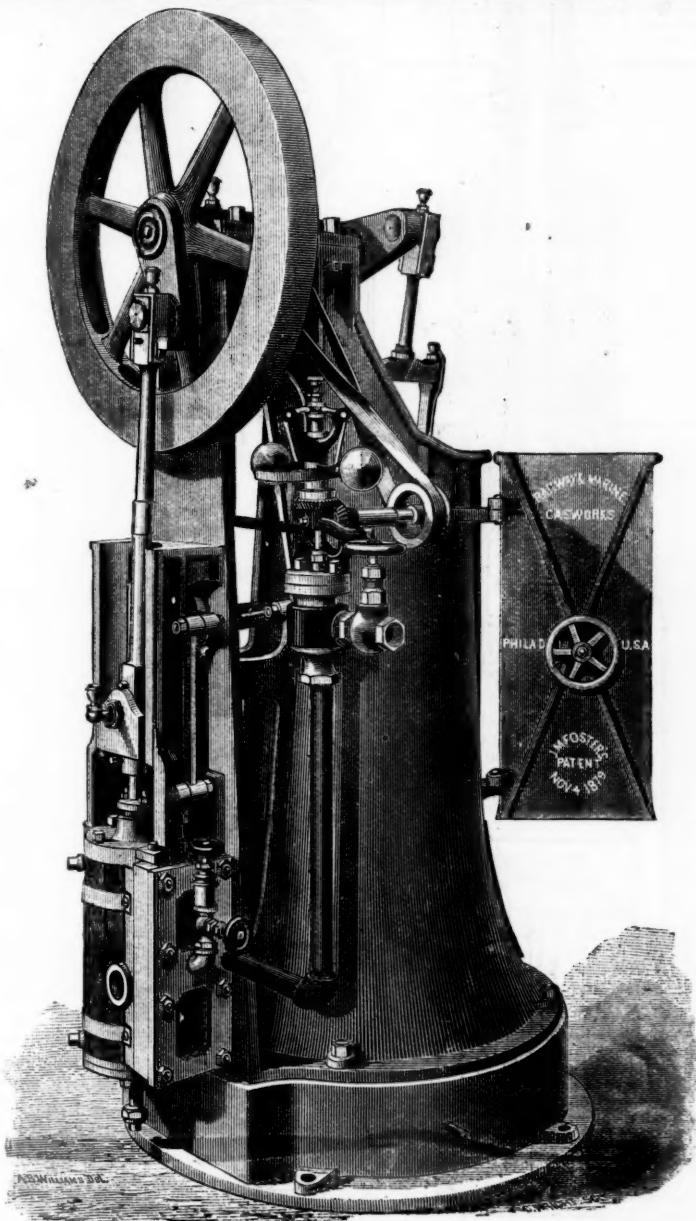


Fig. 4.

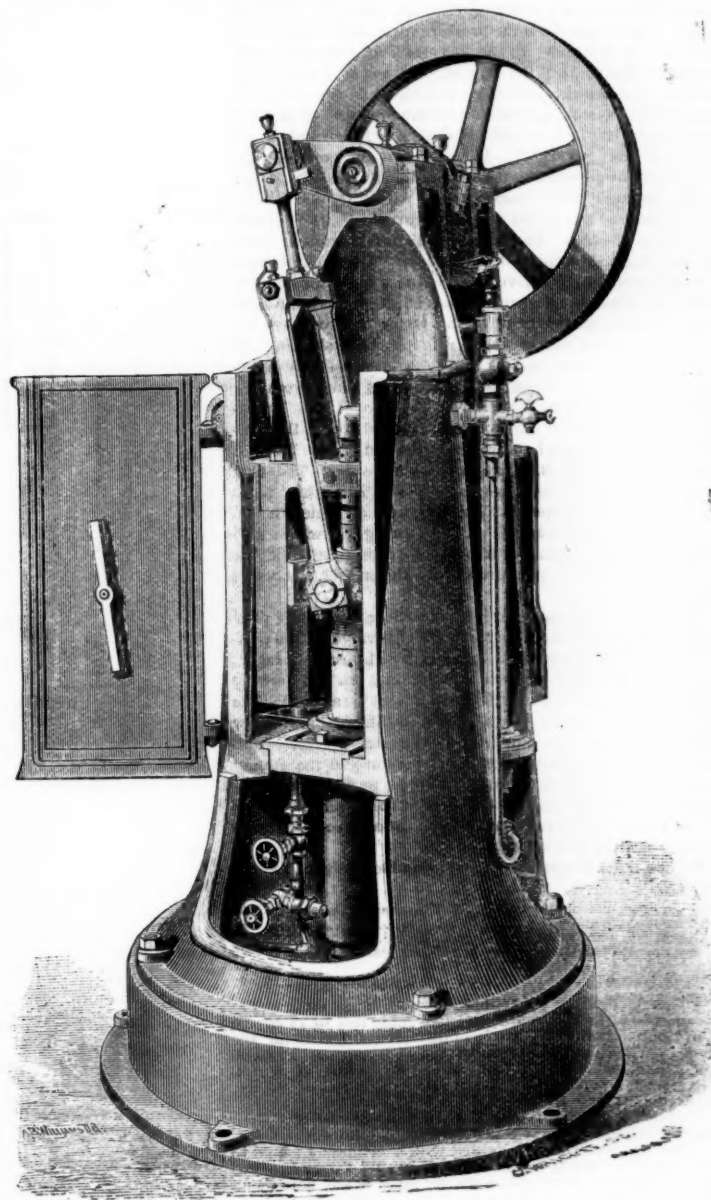


Fig. 5.

## THE FOSTER GAS MACHINE.

same vessel, the absorption of heat, or in other words the cooling effect of the process of gasification, is so great that it becomes difficult to impart sufficient heat to make a permanent gas without heating the retorts so hot as to speedily destroy them or incur the other evils described.

The oil which is to be converted into gas is pumped up from a suitable reservoir into a tank *T*, from which it is conveyed by the pipes *A A* to the siphon pipes *B*, and through them to the retorts. The streams of oil which flow from the ends of the pipes *A A* are protected by a glass *n*, which prevents the oil from being scattered by wind. The bend in the pipes *B* forms a trap to prevent the escape of gas.

After the process in the retorts is completed, the gas, as explained, flows into the hydraulic *H*, which is a sort of trough partly filled with water, and acts as a trap to prevent back pressure in the retorts. The pipes *m* are carried down to near the bottom of the hydraulic, so that gas must pass through the water to escape through the pipe *o*, which is connected to the top. The effect of this is to remove many impurities contained in the crude gas. It is further purified by passing it through the scrubbers *S S*, which are vertical cylindrical vessels filled with perforated iron plates. The gas by coming in contact with these plates deposits any tarry substance it may contain, and is then fit for use.

While this process, which has been described, is not confined in its use to the manufacture of gas for illuminating railroad cars alone, yet it has the advantage, it is claimed, of

consequently there is a diminution of volume when the fluid afterwards becomes cool.

Second, the loss of effect following an imperfect displacement of all the gas from the pump cylinder at each stroke, which results in a re-expansion of the gas left in the cylinder, thus partly filling it with gas that has once been compressed instead of taking a cylinder full of fresh gas at each upward stroke of the piston. Various attempts have been made to overcome these difficulties, but with only partial success, so that generally it has been concluded that it is better to use comparatively low pressures than to encounter the difficulties referred to.

It will be apparent that the advantage to be derived from the use of compressed gas will be increased with the degree of pressure and the consequent reduction in volume, provided these can be attained without additional labor, care or expense. This is especially true of the use of compressed gas for illuminating railroad cars and steamers, where the principal object is to put as large a quantity of gas as possible into a small space, in order to reduce the size and cost of the supply tanks which must be transported.

In order to be able to attain a high degree of compression Mr. Foster has adopted what is known as the compound principle in the gas compressor represented by our illustrations, of which fig. 6 is a section of the pump used. Owing to the length of the pumps and for convenience of illustrating it the drawing of it is made with a vertical scale one-

upon the pistons transmitted to the bearings and journals of the crank and driving shaft, but also by reducing the dimensions of these latter diametrically. An additional advantage in combining the two cylinders and pistons by telescoping one within the other is, that a continuously rising movement is imparted to the gas in its transit through the pump.

The packing of the piston is shown at *S S*, *S S*, and consists of lamp-wick wound around the pistons and represented by dots with a  $\cap$ -shaped leather packing-ring, which can be forced down by the packing-nuts *2 2*, acting on the metal rings *1 1*.

In order to force out at each stroke all the gas which would otherwise occupy the clearance spaces under the pistons, the under side of the latter and the cylinder bottoms are made of a conical form, fitting to each other as shown in the engravings. By filling the latter with sufficient water *W W* to fill the clearance and other spaces around the valves, a perfect displacement of all the gas in each cylinder is secured at each double stroke of the pump.

For the purpose of cooling the compressed gas and absorbing the heat developed by the compression, the lining of the cylinders is made of thin metal tubes. Around the lower tube there is a space *N N*, into which water is introduced through the inlet *M*. This water circulates through the space *N N* and around the cylinder, and escapes through openings in the ring or collar *3 3* into the space occupied

by the upper cylinder. The door, which is shown open in fig. 5, has a rubber gasket around its edge, which makes a water-tight joint when it is closed, and consequently a water-tight compartment of the space in which the cylinder and cross-head work and into which the water, after circulating through the jacket *NN* is discharged. It fills this space until it reaches the cross-bar *Q Q*, when it is allowed to pass off. The large body of water surrounding the upper cylinders and its violent agitation occasioned by the movement of the cross-head *P* are not only efficient as a cooling agent, but the water also comes in contact with the piston packings, protecting them from deterioration or injury beyond that incident to the wear of rubbing surfaces.

In using compressed gas for illuminating purposes, it is essential that its pressure should be properly regulated in passing from the storage tanks to the burners. When it is understood that the pressure per square inch in a tank containing twenty atmospheres of gas is equal to a column of water over 8,000 in. in height, and that the pressure of gas at the point of consumption should be equal to about *sevenths of an inch* of a water column, and that a loss of either light or gas occurs when the pressure varies from that point, and that a governor, to be a perfect instrument, must automatically control the flow of that gas at the burners, keeping the pressure at  $\frac{1}{10}$  of an inch while the gas in the supply tank is being consumed and the pressure diminished down to the last inch, it will be seen how important is the office of the governor. Fig. 7 is a section of the Foster patent governor. Gas is admitted at the inlet *A* and passes through the compensating valve *B* and enters the chamber *C*, which has a cover *D D* consisting of a flexible diaphragm, which is pressed down by a volute spring *V* on top. This diaphragm is connected by a lever *L* with the compensating valve *B*. When the pressure in the chamber *C* accumulates under the diaphragm *D* it lifts the latter and with it the end of the lever *L* and closes the valve *B*, thus shutting off the flow of gas from the tank into the chamber *C*. By opening the stop-cock *F*, through which the gas flows from the regulator to supply the burners, the pressure in *C* is gradually diminished and the volute spring *V* forces the diaphragm down, which in turn lowers the end of the lever *L* and opens the valve *B*, thus admitting more gas. The flow of gas to the burners through the stop-cock *F* is thus regulated by the volute spring *V*, the tension of which is adjusted by the screw plug *E*. A coil spring *G*, which surrounds the valve-stem *B*, is made to compensate for the variation of the high pressure against the end of the valve stem.

In practice, the stop-cock *F* is opened and the full pressure of the gas is turned on at the needle valve. The pressure at the burners is there regulated by the screw plug *E*, and when properly adjusted the jam-nut on it is set up tightly, after which no further adjustment is required. The governor will then regulate automatically the flow of gas and keep its pressure to the burners perfectly uniform, regardless of any change of pressure in the supply tank or of the number of burners lighted, provided the consumption is not beyond the capacity of the governor.

The cost of supplying this gas to one of our prominent railroads was estimated as follows:

"For a daily production of 30,000 cubic feet per coal gas standard.	
80 gals. crude petroleum at 4½¢. (N. Y. quotation Dec. 11).	\$3.60
15 bushels coke at 4¢.	60
Labor of one man per day.	1.50
Average cost of repairs per day at \$60 per year.	20
Total cost.	\$5.90

"This for lighting your shops, depots, offices, etc., would be equivalent to 18½ cents per 1,000 cubic feet of 14 candle coal gas. Estimating a monthly consumption for the above purposes at 500,000 cubic feet with coal gas at \$2.50 per 1,000 (Jersey City prices), we find net saving of \$1,152 per month, or sufficient to pay for the entire cost of the gas works in less than six months.

"Cost of Lighting Cars.—With gas at the foregoing rates it will cost to light passenger cars as follows:

"For a four-burner car lighted with a brilliancy equal to 70 standard sperm candles, each candle consuming 120 grains per hour, about five cents per night of ten hours, and for a three burner car with a light equal to 52 sperm candles, about 3½¢ per night of ten hours.

"Cost of fitting up cars \$60 and upward, according to capacity of cylinders and apparatus."

These gas works have been in use on the Philadelphia & Reading Railroad since 1874, with great satisfaction, as stated in their annual reports for 1875 and 1876: the Pennsylvania Railroad is using the compressor and governors, and the government is using the complete system for lighting the Currituck and Albermarle Sound beacons.

Any further information required may be had by addressing Mr. J. M. Foster, General Manager of the Railway and Marine Gas-Works, No. 208 Evelina street, Philadelphia.

#### Mr. Vanderbilt on the Situation.

The following report of an interview with Mr. William H. Vanderbilt is published in the Chicago Times of July 23:

Mr. William H. Vanderbilt, several members of his official staff and a number of personal friends, arrived in this city over the Lake Shore & Michigan Southern Railway at 5.30 o'clock on last evening.

A representative of the Times called upon Mr. Vanderbilt, at the Grand Pacific Hotel, regarding the report published a few days since that he had secured, or was likely to secure, control of both the Chicago & Northwestern and the Union Pacific, and that he was promoting the immediate construction of the Oregon Short Line, from Granger, on the Union Pacific, to Portland, with the object of owning and operating a continuous line of railway from ocean to ocean.

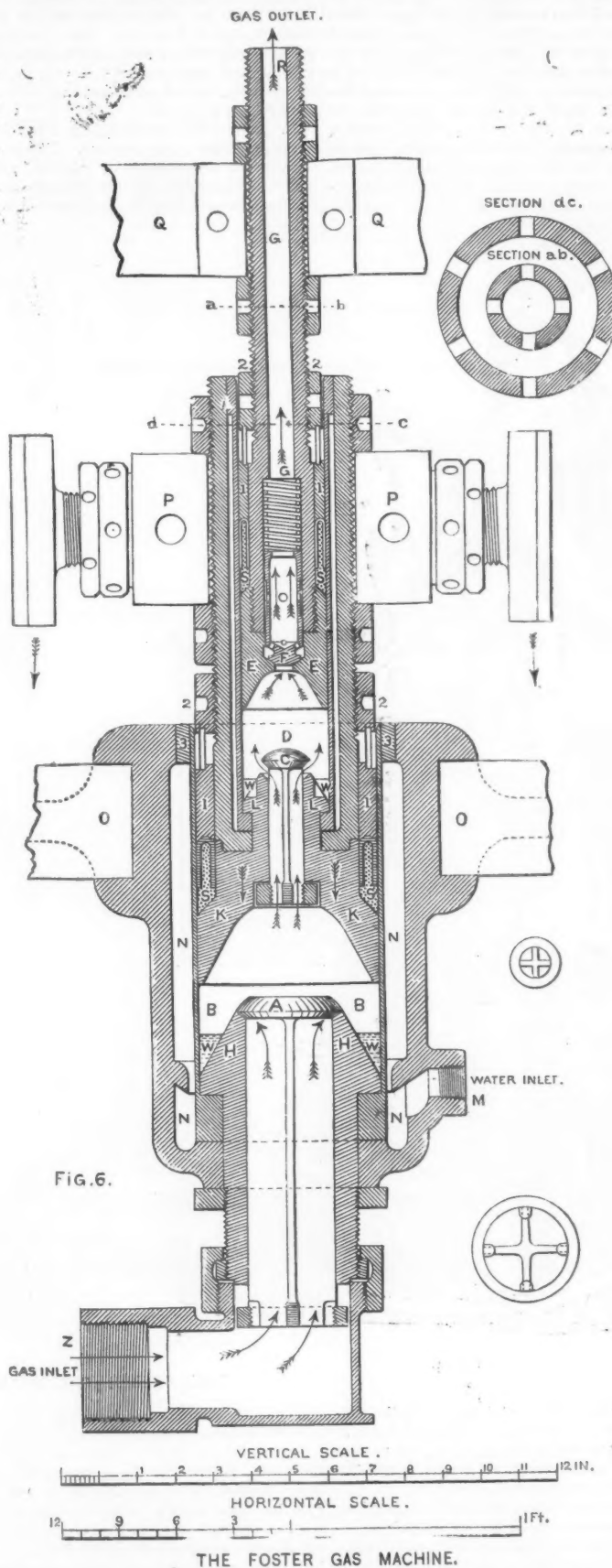
"There isn't a shadow of truth in that story. I know absolutely nothing about the Oregon Short Line. I have no desire to control any more railroads than I already control, and I might say that I have little desire to control them. I am trying to lessen my cares and responsibilities instead of

adding to them. I have, it is true, invested largely in all the leading Western roads, for the reason that they are less likely to be viciously interfered with than the large Eastern lines. But I haven't sought to have any voice in the managements of the Northwestern, Chicago & Rock Island, Chicago, Burlington & Quincy, and Union Pacific. With one exception, I have had no hand in the management of any of these roads. I have, I may say, taken some interest in the management of the Chicago & Northwestern—some of my

but I take things as they come, and at the end of the year the average is not far out of the way. We are common carriers, and we must do as our neighbors do. We have no differences to settle. Some of the other people charge us with the responsibility. You know every fellow has got to protect himself by giving somebody else the devil."

"Do you fear the New York, Chicago & St. Louis road, just projected, as a future rival to your system of railways?"

"Not at all. No railroad can parallel us that will not



friends are in the direction—because it is a good and growing property. I wouldn't have a line from ocean to ocean if it were a free gift to me to-night. My cares are onerous enough now without spreading them out to the Pacific Coast. All the properties I have named are good and admirably managed, and I have no desire to interfere with the present ownership and managements."

"It is said that you are unloading some of your stocks."

"I haven't bought or sold a share of New York Central or Lake Shore stock for a year up to July 1. A few days ago Lake Shore went a little lower than I thought it ought to, and I bought one thousand shares. I pay no attention to the stock lists. I have not been in Wall street for five years, and I don't go below Canal street twice a year."

"Is anything being done to end the present war of freight and passenger rates?"

"Nothing. We didn't break the rates. We are simply following the lead of other people. I don't know who is responsible for the trouble. I make no accusations. It doesn't keep me awake nights. In railroading, as in your newspaper business, I suppose, we have a good many ups and downs;

starve to death. We will starve it, not maliciously, but by the superiority of our position, before it can get in a condition to live. We are just finishing our fourth track. We can perform more service for the public than any four two track railroads that could be built parallel with us. Why? you ask: Because, when one of those roads is crowded with freight the passenger business must be inconvenienced, or vice versa; but with us, with our four tracks, all business, of whatever volume, is moved independently and without friction or conflict. We have always been friendly, in the Legislature and otherwise, to the water-ways that parallel us; for, if the water-ways attract business to Buffalo, we stand a chance of getting a share of it. The Pennsylvania Railroad Company adopted a different policy. It bought up all the canals and then drier them up. If we had done that the business would not have been so largely drawn to Buffalo, but would have been diverted to other routes; and such diversion would be infinitely more hurtful to us than the competition of the canals."

"But what do you think of the New York, Chicago & St. Louis Railroad project as a financial scheme?"



"Why, it is only a speculation. The character of the material which is being put into the construction proves that conclusively. The purpose is to float a lot of securities. That's all there is in any of these construction companies. There should be a law in every state—as there is now in a few states—which would prohibit a company's building a road at a cost of \$40,000 per mile, then issuing securities in the shape of ordinary bonds, income bonds and common and preferred stock at the rate of \$40,000 per mile of each. This is being done all the time. And reputable men, too, who you would think would scorn to engage in such schemes, are promoting this style of speculation. It is perfectly outrageous."

"It is said that you intend to issue New York Central income bonds, dividend-paying, to the amount of \$90,000,000, to be distributed among the shareholders?"

"There is no truth in the statement."

To a reporter of the Chicago Tribune Mr. Vanderbilt is represented as saying:

"How about the railroad war?"

"Don't know anything about it."

"What about the cut in railroad and freight rates?"

"I don't know."

"But you're interested?"

"Yes, but I have those to whom all this work is delegated, and I don't bother myself about it."

"Don't you take any interest in the fight?"

"When the proper time comes I may have something to say. We didn't commence this cutting of rates, and we are only following where others are leading. We can keep up as long as they can. But the thing may not come to that. The other parties may think that they have a point to gain and believe that they have accomplished all that they started out to do without going any further."

"Why is all the cutting done from the East?"

"I don't know."

"Doesn't the West give you lots of passenger and freight traffic?"

"Yes."

"What do you think about the railroad war, anyhow?"

sequences of unregulated competition should be avoided. Thus far no means have been found for avoiding them but the voluntary agreements of the companies. They have been forced to adopt these in self-defense, and the public has derived a certain advantage from them in steadiness of rates while they are adhered to. But there is no means of making sure that the terms of these agreements are just and equitable, so far as the public is concerned, or of compelling their uniform and permanent fulfillment. It is the breaking of the agreement on the part of one of the parties to it that precipitates wars of rates and brings a cut-throat competition into effect, and there is no legal power to prevent it.

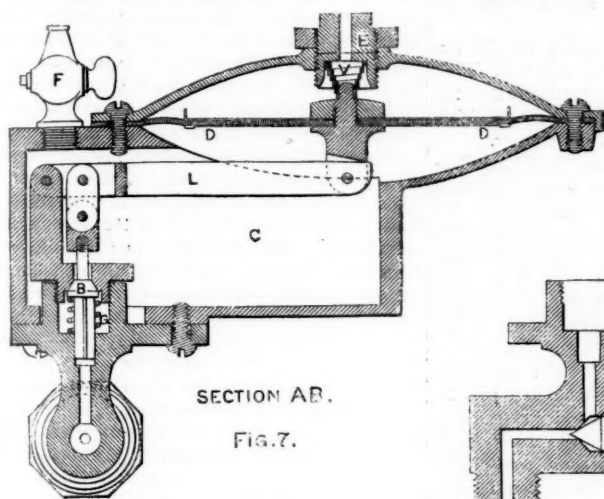
It is well known that for some years an agreement has existed between the trunk lines from the West to the seaboard whereby their rates from competing points are fixed and maintained the same for all the lines. To make this part of the agreement practicable it has to be accompanied by another known as the "pooling arrangement." By this the share of traffic to which each line is to be regarded as entitled is fixed at a certain percentage of the whole, and an officer employed by the combination and generally known as the "Pool Commissioner" supervises the distribution. The practical effects of this system are far better than those of unregulated competition, and Mr. Albert Fink, the present Pool Commissioner and an expert of unquestioned ability on all that pertains to transportation by rail, seems to be of the opinion that it presents the only means of obviating the evils of the latter. His reported words are: "It is the only method by which the railroad problem can be solved." But he admits that it does not solve the problem, and hints at the necessity of legalizing pooling arrangements and subjecting them to government supervision. He says that it is "utterly impossible" for railroad managers "to control the most important branch of railroad management—viz, the maintenance of equitable and fair tariffs." The weakness of the system of co-operation, he further says, is that it "requires the voluntary consent of railroad companies instead of being enforced upon them by legal enactments."

We would suggest that something more is needed than the

she took the railroad instead of the pike. When a short distance from Lorberry Junction, unaware of any impending danger, she was struck by the locomotive of Conductor Tracy's train. She was thrown into the air as high as the smoke stack of the engine and struck the ground at the base of an embankment 15 feet in height. The engineer was unaware of the collision until he saw the girl thrown high in air, and as he afterward stated, "thought it was a bundle of rags." On second thought it occurred to him that some one might have been walking on the track. He stopped the train and with the rest of the crew hurried back to the spot where the collision occurred. Lying on the ground, at a distance of 15 feet below the road-bed, was the body of the girl. She was unconscious and it was at first supposed dead. A hurried examination showed that she was still alive. She was taken up and carried to her home by Coal and Iron Policeman James Wolfe and others. There she revived and her condition but a very short time subsequent to the accident gave her family hopes that she might not have been fatally injured. Medical attendance was at once summoned and a careful examination proved that no bones had been broken, and strange to relate, the girl was enabled yesterday to move about as if her experience had been of the most ordinary character. Those who witnessed the manner in which she was thrown consider her escape from instant death little less than miraculous, and cannot understand how she escaped without any broken bones. Another strange feature of the accident is the fate of the basket which she was carrying when struck. As mentioned, it contained a lot of crockery and \$160.29. When opened, it was found that but one plate out of a dozen had been broken. The money was intact. When the girl regained consciousness her first exclamation was: "What's the matter, what's the matter, what's the matter?" Until informed of the fact, she was unaware that she had been struck by the locomotive.—Pottsville (Pa.) Miner's Journal, July 18.

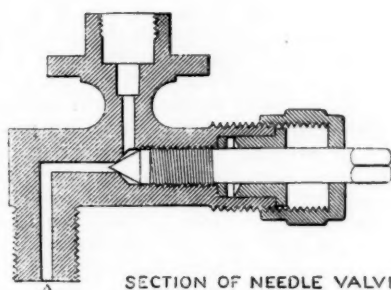
#### Fast Time.

A few days ago a Hornellsville paper noted some fast time



SECTION AB.

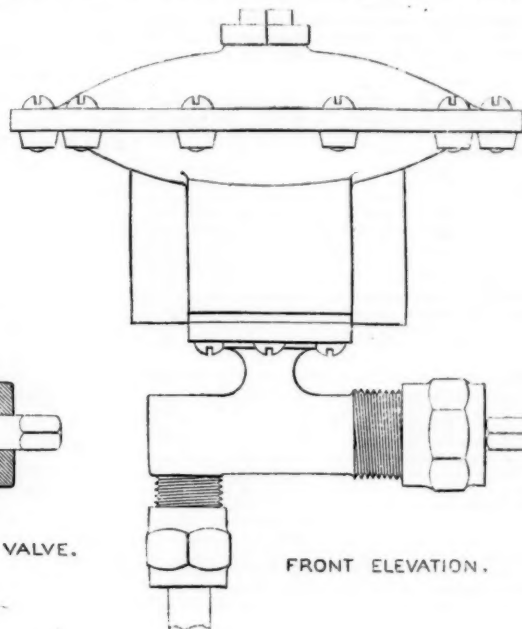
FIG. 7.



SECTION OF NEEDLE VALVE.

Scale of inches.

THE FOSTER GAS MACHINE.



FRONT ELEVATION.

"You know as much about it as I do."

About this time some one came up and handed Mr. Vanderbilt a dispatch, and the reporter took his departure.

#### Railroad Competition.

It may seem like a fine thing to be able to go to Chicago for \$8 or less, and to have the railroad companies cutting their rates day by day to see who will get lowest. But it is evident that the temporary advantage to the casual traveler is obtained at somebody's expense. Such a war is always carried on at a loss, and if it should extend to freight rates it would throw the business of the country into confusion. Low rates are not a public benefit unless they are remunerative rates, for there is no public advantage in the wreck and ruin of railroad lines and the bankruptcy of corporations. In the first place, the holders of their stock and bonds, the returns from which and the value of which depend on the business of the roads, constitute a very considerable part of the public. Most people who have succeeded in saving much by their industry and prudence have some part of their means invested in railroad securities, and they are interested in the stability of the business of railroads. Besides this, all business calculations are based to some extent on the cost of transportation, and it is everybody's concern that rates should not be a constantly varying factor. It is of less importance that they should be low than that they should be certain and steady. A war of passenger rates is of far less moment than one of freight rates, but it is not easy to keep a war once begun between rival companies within the limits of the least danger, and the slaughtering which is now going on between agents and scalpers involves a peril for which cheap tickets to Chicago, Cincinnati and St. Louis are no compensation. There are intimations already of breaks in the freight tariffs from the West, and of troublesome consequences to come, if the fierce competition in passenger tickets continues.

The state of things existing and threatened suggests certain considerations on the general subject of railroad competition. Wars of rates appear to be the inevitable result of unrestrained competition on through lines. There are, for instance, four great trunk lines between Chicago and New York, with connections west to St. Louis, St. Paul, etc., and connections east with Boston, Philadelphia and Baltimore. Leave these lines to free competition and they will be constantly trying to underbid each other, each with a view to increasing its own share of the traffic. This will result in wars of rates more or less frequent and attended with irregular losses and occasional disasters, and will beget a constant uncertainty in both freight and passenger tariffs which would be a disturbing element in business. It is certainly for the interest of the public and of the railroad companies that these con-

legal enforcement of agreements made by the railroad companies themselves. When they enter into these agreements they have in view their mutual interests and advantages. But the public has also a concern in the matter, and the authority of government should intervene not simply to ratify and enforce whatever the managers of the corporations may agree to for their mutual security and profit. It should also have a voice in settling the terms of the agreement—if that is to be the name of it—in determining what tariffs are "equitable and fair," and in placing on a basis of continual justice and equity the relations of the competing lines to each other, and of the whole combination to the public. For this purpose the authority of the government and of the public should be embodied in a permanent commission or tribunal with the necessary powers and functions. Of course the supervision of the rival trunk lines should be only a feature in a broader scheme for the regulation of all interstate commerce carried on by railroads.—New York Times, July 27.

#### THE SCRAP HEAP.

##### Trial of a Freight-Train Brake.

A trial was had on July 12 on the Central Railroad, of Georgia, near Savannah, of the freight-train brakes made by the American Brake Co., of St. Louis. The train consisted of a locomotive and 12 cars, the engine and tender being equipped with the steam driver and tender brake, and 10 of the freight cars with the automatic freight-car brake on one truck under each car.

The following stops were made, as certified by a number of the officers of the Central and the Savannah, Florida & Western roads, who witnessed the trial:

No.	Speed, miles per hour.	Time, sec. onds.	Distance, yards.	Grade.
1.	26	40	320	Level.
2.	28½	40	266	Down grade.
3.	20	33	213	Level.
4.	30	37	253	"
5.	15	21½	93	"

The train, it is stated, was always under complete control of the engineer. Both wheels and brake-shoes under all the cars were new and not yet worn down to good bearings.

##### A Very Narrow Escape.

One of the narrowest escapes from death perhaps on record was made on the Philadelphia & Reading Railroad on Saturday. A girl named Mary Clevensine, 15 years of age, living near Lorberry Junction, had been sent to Pinegrove by members of the family who worked at the colliery of Miller, Graeff & Co., for their pay. She made the trip to Pinegrove in safety and obtained the pays, which amounted to \$160.29. This money she placed in a basket which already contained a quantity of crockery. On the return trip

made by Mr. John Welsh, one of the engineers who runs 4 and 5 between Hornellsville and Susquehanna (on the New York, Lake Erie & Western). On Sunday morning last Mr. Gib. Wallace, who is also an engineer on those trains, did some tall speeding. Gib. brought his train behind engine 94 from Hornellsville to Elmira, 60 miles, in 75 minutes. Two stops were made, at Addison and Corning, consuming at least ten minutes, thus leaving the running time at 65 minutes, which is about as near a mile a minute as the boys generally get.—Elmira Advertiser.

On July 23 a special train with Drs. Hamilton and Agnew, the President's consulting physicians, was started from Jersey City for Washington at 3:09 p. m. Between New York and Philadelphia some 15 minutes were lost in waiting for the track to be cleared, but West Philadelphia was reached at 4:51, the run of 89 miles having been made in 102 minutes. From Philadelphia to Bay View, just outside Baltimore, a distance of 93 miles, the time was 112 minutes. The transfer from Bay View to the Baltimore & Potomac road consumed some minutes, but good time was made to Washington and the train reached the depot there at 7:51, just 4 hours and 42 minutes from Jersey City, an average of about 48½ miles an hour. This includes the delay of 15 minutes east of Philadelphia, a stop for water and slowing up over five long bridges between Baltimore and Philadelphia, and the necessary slow time in transferring the train at Baltimore. It is, we believe, the fastest run on record between New York and Washington.

##### A Plausible Fraud.

To the shrewd observation of Mr. J. B. Mulliken, General Manager of the Detroit, Lansing & Northern Railroad, is due the credit of discovering a first-class pass fraud, and a reprehensible dead-beat, whom railroad men all over the country should "lay for." July 7 a well-dressed, pleasant-looking man, representing himself as Charles Lee, applied to Mr. Mulliken for a trip pass over the road. He had a letter of introduction purporting to be from C. O. Russell, General Superintendent of the Boston & Albany Railroad Company, and asking for a trip pass. Mr. Mulliken told his secretary to make out the pass, and so the genial Mr. Austin did so. "How long will you be gone?" he asked. "Oh, few days; visit my folks," said the handsome stranger carelessly. So Mr. Austin made out the pass good till the end of the month. The man took the paper, and left. But Mr. Mulliken thought the writing did not look right: and besides, the printed letterhead of the letter bore the date of Springfield instead of Boston. So he wrote Mr. Russell and asked if the letter was genuine, and yesterday received a reply saying the letter was a forgery and the alleged Mr. Lee a fraud. His plan is undoubtedly to get all the passes he can by forged letters, and then sell them to scalpers. He is of medium height, wore a brown moustache, and has a slight cast in his right eye.—Detroit Post and Tribune.





Published Every Friday.

CONDUCTED BY  
S. WRIGHT DUNNING AND M. N. FORNEY.

## CONTENTS.

ILLUSTRATIONS.	Page.	GENERAL RAILROAD NEWS: Page.
The Foster Gas Machine,	410, 411, 412, 413	Elections and Appointments.....418
EDITORIALS:		Personal.....419
The Economy of a Four-Track Road.....414		Traffic and Earnings.....419
The Origin of the Railroad War.....414		Railroad Law.....419
Abolishing the Tolls on the Erie Canal.....415		The Scrap Heap.....413, 419
Exports of Breadstuffs for the Fiscal Year.....415		Old and New Roads.....420
The Late William S. Hudson.....415		ANNUAL REPORTS:
Pennsylvania Railroad Earnings and Profits.....416		Philadelphia & Reading.....422
Low Passenger Rates.....416		MISCELLANEOUS:
Immigration and Railroad Extension.....416		Construction of Brakes for Freight Cars.....409
The Late Wm. Miller Rober.....416		The Effects of Heavy Car Loads.....409
Record of New Railroad Construction.....417		Who Controls Rates?.....409
EDITORIAL NOTES.....417		Foster's System of Lighting Cars by Compressed Gas.....410
GENERAL RAILROAD NEWS: Meetings and Announcements.....418		Mr. Vanderbilt on the Situation.....412
		Railroad Competition.....413
		The Future of the Steel Trade.....417
		Locomotive Returns, February, 1881.....422

## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## THE ECONOMY OF A FOUR-TRACK ROAD.

Mr. Vanderbilt is reported as saying at Chicago that any new railroad parallel to his would be starved to death by its inability to work as cheap, chiefly on account of the four tracks of the New York Central. This, of course, applies to only one of the four Vanderbilt roads—to the New York Central. The Lake Shore and the Michigan Central have not yet a double track throughout the length of their main lines, and the Canada Southern has but a single track. But taking the New York Central itself, a great deal too much virtue is attributed to its four tracks, and always has been. An additional track before it is needed is like one more horse than is needed on a farm, which stands eating its head off in the stable. Track, unfortunately, has to be maintained. The wear of rails is about in proportion to the loads passing over them; but the ties rot and the road-bed wastes by the weather whether there is any traffic or not. Of course, there comes a point when a track must be added for economy's sake, but there is every reason to believe that this point had not been reached when the New York Central's four tracks were laid. When this step was determined upon the traffic of the road and the country had been increasing rapidly year after year, and it seemed reasonable to count on the doubling of business every few years. But after the work was under way came the panic of 1873, and thenceforward for some time traffic was comparatively stationary.

That the four tracks were not necessary is sufficiently proved by the fact that last year the Erie, with approximately the same length of road and main line, but lacking a few miles of a complete double track even, had 1,721,112,095 ton-miles of freight, which is more than the New York Central ever had in a year before October, 1877. And the Erie's expenses per ton per mile were 0.584 cent, against 0.541 reported on the New York Central. The Central, however, includes as expenses some items not so charged on other roads, and deducting for the chief of these, the average expense per ton-mile was 0.502. Considering the

grades of the Erie the difference is not more than could easily be attributed to them alone; and if it had had four tracks, there can hardly be any doubt that its expenses would have been heavier rather than lighter, on account of the larger maintenance expenses, besides which there would have been interest to pay on the cost of the two additional tracks.

Again, the Pennsylvania Railroad on its "Main Line and Branches," which are of nearly the same length as the New York Central system, has generally had about as much freight as the New York Central, sometimes more and sometimes less. Last year it had 2,298,000,000 ton-miles, which except in the same year had never been equaled on the New York Central. Now it carried all this traffic, and generally without difficulty, always asking for more, on a double-track road, reinforced by only 80 miles of third and fourth track, in stretches where the road is most crowded, and of course with plenty of sidings, and at an average expense of 0.474 cents per ton per mile.

Again we note that not only is the New York Central's reported expense of 0.541 more properly 0.502, but that differences in the method of dividing passenger and freight expenses may make this amount still less, or the Pennsylvania's greater; still it is plain to see that a vast freight business may be done without treble or quadruple tracks at an expense so low that not even the New York Central can afford to carry for less.

The Lake Shore road itself has lighter freight expenses per ton mile (0.435 cent) than the New York Central. It, however, has not nearly so large a traffic now. It has, however, a larger traffic than the New York Central had until within a very few years.

We do not prove by this that all the New York Central's traffic could be carried over the Pennsylvania or the Erie, as they stand now, as cheaply as over the Central's four tracks. We did not set out to do that, but only to show that a line parallel to the New York Central would be able to compete with it without having four tracks. The Central's traffic is complicated by a very large passenger traffic, much larger than any other of the trunk lines has, and this gives it a reason for separating the freight and passenger tracks which none of them have. But no new parallel road will have anything like the passenger traffic of the other trunk lines, not to say the New York Central, and with a double track and well-placed sidings such a road, without a doubt, could carry as much freight as the New York Central has. All the trunk lines have a rapidly-increasing traffic; the Pennsylvania and the Erie seem likely to have as much within a few years as the New York Central has now; they make eager efforts to get more traffic, but they do not think of building third and fourth tracks. If traffic continues to grow they will doubtless have them in course of time; for the sidings, which they lengthen from time to time, as traffic presses, will finally meet each other and become continuous tracks. The time would be greatly hastened, doubtless, if the passenger grew as fast as the freight traffic. As it is, it will probably be a long time before the New York Central has any four-track competitors; but all the same it will have plenty that will carry and that can afford to carry as cheaply as it does.

But while it is doubtful whether transportation has been cheapened, even on the New York Central, by the use of four tracks instead of two, doubtless the running of trains has been made much simpler and considerably safer thereby. An enormous traffic and a vast mixed passenger and freight traffic can be got over a double-track road with very little delay; but it cannot be done without a great deal of skill and the constant use of it. A great deal more and a great deal better superintendence is required to do it. If you lack the steel you must use plenty of brains, and these of the best quality.

## The Origin of the Railroad War.

Mr. Wm. H. Vanderbilt, on his visit to Chicago to see Maud S. trot, was interviewed by a reporter, and the report of this interview, which we copy elsewhere, will be found interesting reading. Mr. Vanderbilt is generally charged with the responsibility of the present war of rates. But he says in the interview, "We didn't break the rates. We are simply following the lead of other people."

If we go back to what we may call the predisposing cause of the railroad war, Mr. Vanderbilt is doubtless right. The cutting of rates in February, March and April was doubtless made chiefly by competitors of the Vanderbilt roads, and at least it resulted in great diversions of traffic from the New York Central Railroad. But when the railroad war is spoken of there is generally meant the successive reductions of rates in May and early June, which resulted on the 17th of

June in the present quite stable but very low rates of 15 cents per 100 lbs. from Chicago to New York. Now the Vanderbilt roads at this stage of the game are reported to have been the aggressive party; and it was they which refused to make any arrangement for settling the difficulties; so that, while the Vanderbilt roads were not the first to cut the rates, it is probably true, nevertheless, that but for them the cutting of rates in the early spring would not have resulted in a railroad war in the summer. All the other roads, we understand, were willing to make a final settlement, dating back to cover a large part of the period of irregular rates, and leave all disputed questions to arbitration. The negotiations had and the failure to reach a peaceful conclusion led them to believe that Mr. Vanderbilt preferred that the through traffic should be made unprofitable for some time; and they have since made all sorts of surmises as to what his object was. Some have been uncharitable enough to say that he wished to bear stocks; others, that he desired to discourage the construction of the many new parallel roads that are now planned or under way (which is a perfectly legitimate object if sought by legitimate means); again, it is suggested that he wished to show that such practices as those which diverted traffic from the New York Central last winter and spring cannot pass with impunity, but will result in great injury to the aggressors. Doubtless the aggressors are suffering greatly now (they never were traced, we believe), as is every one else; but the Vanderbilt roads, quite as much as any, probably, because they carry as much as any; and the policy of burning one's hand in the fire for the sake of holding one's enemy's hand there is not often followed.

As to the effect of the present low rates on the construction of competing roads, it will depend greatly upon the condition of the several projects. All the lines planned claim that "all the money has been subscribed." This, however, is a very different thing from having all the requisite capital on hand. Subscriptions made, even when a percentage has been advanced, are not always paid, and if the subscribers see that they are not likely to be a good investment, a very large part of them surely will not be paid. Some of the projected lines, however, are sure to be carried through, unless we have a financial panic, of which at present there is no sign. The New York, Lackawanna & Western is well advanced; a great deal of work is done on the New York, Ontario & Western (which is largely made up of road already built); a great amount of grading is done from Buffalo westward on a line parallel to the Lake Shore; the Erie's Chicago connection, the Chicago & Atlantic, has the capital all provided, we believe.

Now, we have no doubt that it would be a good thing for the existing trunk lines if all these roads and many others similarly situated should not be built. Further, we regard it as a national misfortune that such roads should be built; simply because they add at great cost to facilities already ample, and because their inevitable result will be to increase the cost of transportation, whatever it may be on the price. (And, by the way, we may say that the effect on the price is likely to be the prevention of a reduction of price that would otherwise follow the increase of the through traffic.)

Of course these considerations have no effect on the projectors of these roads. The only question for them to consider is whether the prospect for traffic and rates is such as to show that the profits of the proposed road will yield a good return on the capital invested in it. That is as far as their duty extends. With "free trade" in railroads, such as now exists in this country (but not, unchecked, in any other country), the capitalist is justified in putting a railroad anywhere that one can earn an income, without reference to its effect on other transportation lines or the aggregate cost of transportation to the country.

A good deal might be said as to the ability of a new line to command traffic; but we shall content ourselves here with saying that it will require something more than a road from New York to Buffalo in order to secure such a through traffic as the New York Central and the Erie now have, and something more than a road from Buffalo to Chicago to command a traffic like the Lake Shore's great business. We have seen the Baltimore & Ohio several years ago build a road into Chicago, which has in no year, we believe, secured as much as 8 per cent. of the Chicago rail shipments eastward, while the oldest of the Chicago roads has had more than 80 per cent. The Michigan Central and Great Western line, between Chicago and Buffalo, is duplicated almost by the new Chicago & Grand Trunk and the Grand Trunk; the Michigan Central carries 26 per cent., and the Chicago & Grand Trunk 10 per cent. of the Chicago rail shipments eastward. For any road from Buffalo east to secure a



traffic comparable to that of the existing lines, it must have the close connections with all the traffic centres of the West which the existing roads have secured only by the expenditure of millions and the labor of a score of years—the Pennsylvania by the leasing of several thousands of miles of Western railroads.

But we set out only to see whether the making of through rates unprofitable this season is likely to prevent the construction of competing lines. And we find that for several of the projects it is probably too late, but that it will probably prevent the starting of any more for the present.

This suggests, however, that the existing railroads and the country will always be threatened by the multiplication of unnecessary competing lines *unless the profit on through traffic is kept very small*. It was the large profits on through traffic last year, the conviction that by the pooling arrangements through traffic would be always kept profitable thereafter, in conjunction with the general improvement of business, that started all these new lines as competitors for through traffic. So long as this business was worth nothing, of course no one would spend money in order to get a share of it.

Now the railroads that carry this traffic have to steer between Scylla and Charybdis. On the one hand, one of the greatest and best founded complaints against the railroads is the great difference between through and local rates. When the through rates are as low as at present this difference is truly immense. Economically it is in every way desirable that this difference should not be so great. (It must inevitably be considerable.) The competition of the water routes is such that it is next to impossible under any circumstances to get more than a reasonable profit on it. On this account it is desirable that the through rates should be kept up generally as high as possible, and the local rates reduced as the growth of traffic and profits permits, thus encouraging the growth of industries on the through lines, which will furnish a traffic that cannot be diverted.

On the other hand, if the through traffic is made anything like as profitable as the local, permanently, we are sure to have new lines built simply for the sake of getting a share of it.

The only conclusion possible seems to be to keep the through rates so low that no new road can get anything like full support from any share of it that it is possible to get.

Thus all forces, the competition of water rates, the low value of the staples carried great distances from the West, and the possible intervention of new through railroad lines, join to compel low through rates and to make a great difference between these and the local rates. One single season of very profitable through traffic, following after a long series of years when it was unprofitable, and not nearly making up for the losses of those years, has hatched a whole brood of new competing companies, some of which are likely to survive and to scratch vigorously for support among the grown flock. Doubtless these have been very greatly encouraged by the unparalleled ease of the money market, the demand for railroad securities, and the disposition to take risks in new enterprises; but these would have found other outlets if the through traffic had not been very profitable last year.

#### Abolishing Tolls on the Erie Canal.

Last week the Senate of New York very unexpectedly reconsidered for a second time and passed a resolution providing for an amendment to the constitution abolishing all tolls on the Erie Canal. This resolution soon after was passed by the Assembly, and now will have to be acted upon by both houses of the next Legislature and submitted to the people before the amendment can become a part of the constitution. But as it was only recently rejected by the Senate, and now is passed by a vote of 18 to 12, its passage may have some significance, even though it should go no further. It had gained favor in the Senate, it is said, by the deadly effect of the present low rail rates on the canal-boat interest. By the constitution, as it stands, the state is prohibited from expending on the canals for expenses, repairs and improvements more than the amount of tolls received on it during the previous year. Thus, if for any reason, such as disaster to the canal, closing it for a prolonged period (unlikely, but possible), or competition by the railroads making it impossible for the boats to pay expenses for the whole or most of the season, the tolls should not be sufficient to pay for putting the canal in order for the next season's business and making repairs that became necessary then, it would have to be closed forthwith. That is, a single exceptionally unfavorable year may close the canal during a year when there would be no doubt of a very profitable business. This is

certainly a very unwise policy. The time may come when it will be proper to close the canal; but this should not be determined by the results of any one season; and the Legislature should not be forbidden to make improvements that will certainly be profitable, because they require a yearly expenditure greater, even several times greater, than the receipts of the previous year. The constitutional provision was adopted, apparently, because it had been common to waste large sums on the canal, for the benefit, doubtless, of contractors who contributed liberally to pay the expenses of running the political machine, which is a restriction very likely merited by the character of the state legislatures; but a transportation route cannot always be maintained under such restrictions.

But the change from this to a policy of absolutely free tolls is as great an abuse as the present restriction of expenditures. It is certainly enough that canal transportation should be freed from the burden of paying interest on the cost of the work. If the time ever comes when the traffic will leave the canal if it is required to pay the expense of maintenance—not in any one year but for successive years—then certainly it will be because the canal is useless to the community and ought to be closed. To keep it open would be equivalent to paying a subsidy of a million of dollars or so to prevent traffic from taking cheaper routes—down the St. Lawrence, over the railroads, or down the Mississippi. That the people of the state of New York will pay such a subsidy with their eyes open is in the last degree improbable. If they do, Canada will be justified in taking the tolls off its canals, and Pennsylvania and Maryland in paying a subsidy outright on all grain shipped to their seaports, and so on.

The canal interest has a right to complain of the competition of the railroads, when it is exercised temporarily, as it always is when it reduces canal shipments greatly, though this competition is not aimed at that interest, for the same reason that shippers have a right to complain of the great and sudden fluctuation in rates made in such competitive contests as we have now. Of permanent and rational competition it has no right to complain, though at some time such competition may really "dry up the canal." If current rates shall be made permanent under similar circumstances of cost and amount of traffic, then the carriers by canal must take the consequences and bear them as best they may, and have no right to ask for a contribution from the public purse in the form of freedom from the tolls required to maintain the canals. But such a railroad policy as we are having this summer is certainly well calculated to gain them such a subsidy, and if the railroads sometime find that they have to compete against boats which have the expenses of maintaining their route as well as the interest on its cost paid by the tax-payers, the largest of whom are the railroads themselves, they will have themselves to thank.

#### Exports of Breadstuffs for the Fiscal Year.

The United States Bureau of Statistics has just reported the exports of breadstuffs from the whole country for the fiscal year ending with June. This is not very far different from the crop-year for all small grains; but the corn exported for the second half of this year will also be of the crop of 1880 almost entirely.

In view of the interest taken in the prospects for exports from this season's crop, it will be interesting to examine this report, which differs from most others published by including exports from the Pacific ports, while on the other hand it of course omits Montreal exports, which are included in most other reports, and which actually affect the grain business of the whole country this side of the Rocky Mountains much more than all the Pacific exports, large as they are. The latter, indeed, affect the transportation and farming interests of the rest of the country nearly the same as Russian or Australian exports. That is, they are only felt by their competition.

We have often said that the only important exports of grain are those of wheat and corn. The following statement of the amounts of each kind of grain exported this year and last will show on what basis this statement stands. In it flour and corn meal are reduced to bushels on the basis of  $4\frac{1}{2}$  bushels of wheat and 4 of corn to one barrel:

Grain Exports Years Ending June 30, 1880 and 1881.					
	1880-81.	1879-80.	Inc. or Dec.	P. c.	
Wheat .....	149,451,770	152,537,282	D. 3,085,512	2.0	
Flour .....	35,435,173	20,788,054	L. 8,647,119	32.3	
Total wheat .....	184,886,943	173,325,336	L. 5,561,607	3.1	
Corn .....	91,250,060	97,716,413	D. 6,466,353	6.6	
Corn meal .....	1,735,532	1,381,424	L. 354,108	25.6	
Total corn .....	92,985,592	99,097,837	D. 6,112,245	6.2	
Rye .....	1,028,255	2,912,744	D. 984,389	31.8	
Barley .....	884,912	1,128,015	D. 243,103	21.4	
Oats .....	358,250	710,890	D. 352,640	49.7	
Total .....	281,044,052	293,172,822	D. 12,128,770	4.1	

Thus wheat and flour last year made up 65.8 per cent. of the whole, and corn and corn meal 33.1 per cent., leaving but 1.1 per cent. for all other grains, which, however, formed 1.6 per cent. of the exports of the previous year.

Thus, when following the course of the exports, it is sufficient when we include wheat and corn and their products.

It will be seen that the total exports decreased 12,000,000 bushels, or 4 per cent. On the theory that we export all our surplus, this is illogical. As we showed last week, the crop of 1880 was 10,000,000 bushels greater than that of 1879. We should, therefore, have exported more, and not less. The fact that foreign demand, as well as our supply, has an influence on exports is sufficient explanation.

We had, it is quite certain, some 30,000,000 bushels of wheat more by the harvest of 1880 than by that of 1879; but we exported, it appears, but 5,500,000 bushels more. A surplus of 20,000,000 bushels left in California alone this year will explain. Besides the average yearly increase of population in this country now requires something like 7,000,000 bushels additional yearly, and the extension of wheat culture requires increasing amounts for seed. An increase of 2 per cent. in the area sown probably requires 1,000,000 bushels.

The decrease in corn exports has been wholly in the first half of this year, the exports from the crop of 1879 (lasting through the calendar year 1880) having been extraordinarily large. Large as these exports are, they are only about 6 per cent. of the country's corn production.

The report now published does not give the quantities exported from each port for the year; but it does give the values. The aggregate of the value of breadstuffs exported was \$265,561,328 the last year, against \$282,132,618 the year before—a decrease of 5.8 per cent. Two-thirds of the decrease occurred in the first half of this calendar year. There was (for the year) a decrease of \$13,400,000 in wheat and flour, and of \$2,300,000 in corn and meal.

The average values reported for the different articles is as follows (flour and meal per barrel; the grains per bushel):

	Wheat.	Flour.	Corn.	Corn Meal.	Rye.	Barley.	Oats.
1881.....	\$1.12	\$5.67	0.55	\$2.92	0.98	0.62	0.40 $\frac{1}{2}$
1880.....	1.24 $\frac{1}{2}$	5.87	0.54	2.80	0.81	0.69	0.40 $\frac{1}{2}$

The decline in the price of wheat and flour may seem trifling, but that in wheat is nearly double the present atrociously low price of carrying from Chicago to New York, and amounted on the year's exports to \$18,700,000; while the lower value of flour amounted to \$1,575,000 more. One reason why the average value of wheat is so low is that an unusually large proportion of it was shipped from San Francisco, from which ocean freights were often 45 cents a bushel, making the price of wheat there much lower of course than at New York, whence the ocean freight was often ten cents a bushel or less, and once as low as two cents. In June the report shows an average value of 81 $\frac{1}{2}$  cents at San Francisco, against \$1.26 at New York and \$1.20 $\frac{1}{2}$  at New Orleans. The latter difference is noteworthy as indicating the probable difference in the cost of exporting; and in this connection we will cite the values of corn: 56 $\frac{1}{2}$  cents at New Orleans and 59 $\frac{1}{2}$  at New York—a very small difference, considering that sail vessels must be towed the long distance from New Orleans to the Gulf, and then have to sail about 1,400 miles further than the distance from New York.

As the values of the breadstuffs are some clue to the quantities exported from the several ports, we give below the percentages of the total exported from each the last two fiscal years:

	1881.	1880.
New York .....	45.6	46.8
Baltimore .....	18.5	19.9
Philadelphia .....	8.6	10.1
San Francisco .....	8.4	8.3
Boston .....	0.5	5.1
New Orleans .....	5.3	3.3
Miami (Toledo) .....	1.5	1.6
Chicago .....	1.5	1.2
Wilmington (Portland, Or.) .....	1.1	1.4
Huron (Port Huron) .....	0.9	0.2
Richmond .....	0.7	0.6
Detroit .....	0.5	0.5
Portland, Me. ....	0.5	0.4
Milwaukee .....	0.2	0.5
Key West .....	0.1	0.1
Total .....	100.0	100.0

Really there is surprisingly little change in the distribution of the exports. The largest gain, at New Orleans, is only 2 per cent. of the whole, and the largest loss, at Philadelphia, only 1 $\frac{1}{2}$  per cent., New Orleans having 5.8 per cent. of the whole; but most of this must have been made in the last half of the fiscal year, and it is significant for what it promises in the future. It is already more than Boston's percentage the year before.

#### The Late William S. Hudson.

The announcement of the death of Mr. Wm. S. Hudson will be received with sorrow by many railroad men throughout the country, and will be felt as a personal loss by the old Rogers men who are scattered about the United States in various positions. For some time past Mr. Hudson's health has been failing, and for nearly a year he has been unable to attend to business, and at times has been a great sufferer, but he retained almost to the end an active interest in his profession. He died quietly at his residence at Haledon, a beautiful suburb of Paterson, on the night of July 20, aged 72 years.

Mr. Hudson was one of the pioneers of the locomotive and was closely identified with its growth and progress all of his active life. He was born near the town of Derby, England, in 1809, and at an early age began to learn the trade of engineer and machinist, serving part of his apprenticeship under George Stephenson. In 1833, when 24 years of age, he came to this country and for a time found work in the engine-room and machine shop attached to the Auburn state prison in New York. He soon left that place, however, and engaged as a locomotive engineer on the old Rochester & Auburn road, now part of the New York Central. Subsequently he ran



on the Attica & Buffalo road and was made Master Mechanic of the road, which he left in 1852 to become Superintendent of the locomotive works of Rogers, Ketchum & Grosvenor at Paterson. In 1856 these works were incorporated as the Rogers Locomotive & Machine Works, and Mr. Hudson was made Mechanical Engineer and Superintendent, a position which he held until his death.

Coming to the Rogers Works to succeed their founder, Mr. Thomas Rogers, in active superintendence, Mr. Hudson was for nearly 30 years the mechanical head of the concern and he has made the Rogers engine what it is to-day and has given the works their present standing. Always a man of active and practical mind, he originated many improvements which are now in constant use, and was able to secure their introduction and trial at once as probably few other men could have done. His whole time was not given to the study of improvements by any means; he was a very careful and watchful superintendent, and few things about the shops escaped his eye. He knew everything that was going on, and while he was generally well liked by his subordinates, he had no mercy for the man who tried to slight his work or pass off a half-finished job. He took much interest in his men, had always a kindly and helpful word for them, and to him many men owe their first advancement and start in life. Quick to detect talent and industry, he was always ready to help a young man who showed a desire to improve, and he gave valuable assistance to many. He did not like change among his men as long as they worked well, and few shops have more old men in them than the Rogers Works, where many have been steadily employed for 20 and even 30 years.

As old age came on, Mr. Hudson grew naturally more conservative, but he did not lose his desire to improve the locomotives he built, or his keen interest in any device which promised to be of practical value. Indeed, the sharpest criticism that has ever been made upon him was that he had very little "taste," that is, very little sense of the beauty of form and proportion. He looked entirely to practical results and was rather inclined to resent any change in the merely ornamental fittings of the locomotive as a waste of time over something of very little importance.

The locomotive was Mr. Hudson's life work, and he was thoroughly absorbed in it. He gave his whole time to his business, and had very little for outside work. He was a Mason in high standing, but never took any prominent public part. His political convictions were strong, and he was attached to his party, but always refused to run for any public office, though several times asked to do so.

Mr. Hudson married before coming to this country and his wife survives him. He had one son and three daughters, but only one daughter is now living. His son was for a time with him, but died several years ago, and his loss was severely felt by the father.

Mr. Hudson was long in receipt of a considerable income from the works and accumulated a competence. He was a liberal man and spent a good deal of money in charity, but in a very quiet way. Some of his improvements in the locomotive were patented and brought him considerable money, but many minor inventions he took no patents for.

His death takes away the last or almost the last of the older generation of locomotive men. At the Rogers Works he will long be missed, although he has trained up more than one man who should be competent to take his place.

#### Pennsylvania Railroad Earnings and Profits.

The June earnings of the Pennsylvania Railroad (on all lines east of Pittsburgh and Erie) were 18.6 per cent. larger this year than last, in spite of the fact that for two weeks of the month (though for lines so far east probably traffic was affected but ten days) the through east-bound freight rates were but about half as great as last year. The increase in expenses was less than 5 per cent., and there is left the great increase of 47 per cent. in net earnings, amounting to \$476,296, which of itself is enough to pay  $\frac{2}{3}$  of 1 per cent. on the capital stock of the company—that is, the whole of the 8 per cent. dividend due to one month. On the lines west of Pittsburgh and Erie, however, the increase over last year in the profits over expenses and liabilities decreased during June from \$387,953 at the beginning of the month to \$284,676 at its end. A much larger proportion of the traffic of these western leased lines is affected by the low through rates.

The gross earnings, expenses and net earnings in June of the lines east of Pittsburgh and Erie have been for the last nine years:

Year.	Gross earnings.	Expenses.	Net earnings.
1873.	\$3,527,427	\$2,845,562	\$681,865
1874.	3,198,989	2,150,146	1,048,843
1875.	2,966,345	2,001,749	964,596
1876.	2,940,192	1,959,180	981,012
1877.	2,446,176	1,612,828	833,348
1878.	2,380,200	1,475,867	904,333
1879.	2,390,809	1,789,815	600,994
1880.	3,221,475	2,209,228	1,012,247
1881.	3,807,436	2,318,893	1,488,543

The gross earnings, though much larger than in any previous June, were a little smaller than in May and March this year, and in October last year; with these exceptions they have not been equaled since October, 1876, when the enormous Centennial travel made them more than four millions. There was, however, so large an increase of expenses over previous months of this year that the profits do not make so good a showing. The net earnings, though so much larger than any other June, were \$200,000 (12 per cent.) less than in May of this year, and smaller than in March and April also. Last year there was a sudden falling-off of net earnings in June, when they were \$464,000, or 31 per cent. less than in May, and were the smallest of the whole year. Compared with May, the falling-off was much greater in gross than in net earnings both years. This can be ac-

counted for this year by the low rates in the last two weeks of the month. These, especially at first, increased traffic enough to make the gross earnings nearly what they were last year from the same kind of traffic, but the larger traffic has also increased expenses, and profits are reduced. The effect of very low east-bound rates can be seen better by the reports for 1879, when the rates were lower in June than at any other time in the history of railroads. The Pennsylvania then had smaller net earnings than in any other June, and 40 per cent. less than in the previous month of May. Its average monthly net earnings that year were \$1,186,462, while in June they were but \$600,994.

For the half-year ending with June the gross and net earnings and expenses for five successive years have been:

Year.	Gross Earnings.	Expenses.	Net earnings.
1877.	\$14,336,396	\$9,606,977	\$4,729,419
1878.	14,451,938	9,100,040	5,351,898
1879.	15,414,058	9,568,403	5,845,655
1880.	19,434,071	11,359,062	8,074,009
1881.	21,553,839	12,550,085	8,997,154

Compared with the first half of 1880 there is an increase of \$2,119,768, or 10 $\frac{1}{2}$  per cent., in gross earnings; of \$1,217,023, or 10 $\frac{1}{2}$  per cent., in expenses, and of \$902,745, or 11 $\frac{1}{2}$  per cent., in net earnings. Besides this gain in net earnings there has been an increase of \$284,676 in the surplus of the earnings of the lines west of Pittsburgh and Erie over their expenses and liabilities, which makes a gain to the Pennsylvania Railroad Company of \$1,187,421 in profits, which is equivalent to about 1.7 per cent. on the stock outstanding before the recent increase, which increase represents the stock of the Philadelphia, Wilmington & Baltimore stock purchased.

We get a very inadequate idea of the growth of business of this company by comparing it with 1880, however. We see from the table that the increase in gross and net earnings has been continuous since 1877, and since that year gross earnings have increased 50 per cent. and net earnings 90 per cent.; and going back only to 1879, we find an increase of 40 per cent. in gross and of 54 per cent. in net earnings, the increase in the latter for the half-year being sufficient for a dividend of 4 $\frac{1}{2}$  per cent.

The effect of the low freight rates will first be fully felt in July, when, too, the low passenger rates will affect earnings for more than half of the month. Low passenger rates for the first few weeks, however, are largely neutralized by increased travel, and expenses do not increase in proportion, so long as the traffic can be handled without additional trains. Taking all its lines together, the Pennsylvania has more through traffic than any other company.

Last year beginning with July the traffic of this road and the Baltimore & Ohio, as of many other roads, was materially increased by the movement of the enormous winter wheat crop grown on the lines west of Pittsburgh, which was harvested and marketed unusually early. This year the crop is much lighter, it was harvested later, and the demand is so much less pressing that it is not likely to be marketed freely before August, and this of itself, without reference to the lower rates, may be expected to reduce the earnings, especially of the lines west of Pittsburgh.

#### Low Passenger Rates.

The war over passenger rates continues, with great interest to the public, which is refreshed nearly every day by a new cut of half a dollar or a dollar. Why this method of cutting off the dog's tail an inch at a time is practiced it is hard to see. One good cut near the root, say to a dollar from New York to Chicago, would effect the object (if there is any) quicker, and lessen the agony. At this writing the railroads charge \$7 at their Broadway offices, and the scalpers half a dollar less. It seems not generally understood how the scalpers can underbid all the railroad companies, when two of them (it is understood) give them no rebates. But they do a large business in tickets to intermediate points. The passenger to Buffalo or Pittsburgh or Cleveland is provided with a coupon from a through ticket to Chicago or St. Louis, and the other part is sent on to scalpers at the passenger's destination and there sold to a passenger going farther west. It takes lively work to do this, as the limited through tickets sold give but a few hours margin. Latterly some of the roads have introduced a continuous through rebate ticket. The passenger signs this when he buys it; pays the full rate, and is given a rebate of the difference between the full and the reduced rate at his destination on signing the ticket. The clerk at the other end compares this with the signature written on starting to see that they are by the same hand, and only the original buyer can collect the rebate. This is expected to prevent such scalping operations as we have just described.

Boston has begun a little war on its own account, but intended doubtless to force the fighting and put an end to the struggle at the earliest possible moment. Boston, by the direct lines, has a rate one dollar higher than the New York rate to Chicago; but the Grand Trunk is allowed to charge two dollars less than the other roads. Its road being much the longest, it makes less profit at regular rates and greater losses at the low rates than the other roads. When the rate from New York was \$9 and the other Boston roads were making it \$10, the Grand Trunk instead of making it \$8 preferred \$5 as a handy sum less likely to require change and more likely to make the roads that have a heavy passenger traffic get tired of the business. This, so far, has not been followed at New York; but there are signs that there may be a considerable further reduction soon.

The lower rates attract a large traffic at a season when it is usually very light. It will be found, however, that many of these travelers are merely anticipating the time of their journeys, and if rates are restored soon the travel then will doubtless be much lighter than it would have been had there

been no period of low rates. It will be as in the years before and after the Centennial. All over the country people postponed or anticipated journeys in order to make them during the Exhibition, and in 1877 there was the most woful account of thin traffic we have ever had.

In course of the reductions, the emigrant rates soon became lower than the first-class rate. There was no difficulty about emigrant traffic (which this year has been divided in definite proportions among the several roads); but there is nothing to prevent an emigrant from traveling first-class if he is willing to pay the fare, and he would certainly prefer to pay \$8 for a seat in a comfortable first-class car in a fast train rather than give \$14 for carriage in a not very comfortable (and sometimes very uncomfortable) emigrant car on a slow train. So about a week ago the emigrant rate was reduced, and has since been kept about on a level with the first-class rate.

All this is making a conspicuous hole in the profits from passenger business. The rate in the other direction is reported to be generally \$15 from Chicago to New York, or five dollars less than the regular rate—quite extortionate compared with the west-bound rate. The latter is now about  $\frac{1}{2}$  cent per mile. To intermediate competing points the reduction is not so great, but it is considerable on a very large proportion of the passenger traffic as far west as the Mississippi.

#### Immigration and Railroad Extension.

Immigration for the last fiscal year is reported by the Bureau of Statistics in a circular in which it is compared with the immigration of previous years. The total number arriving during the last fiscal year (ending June 30) was 660,239, against 457,257 the previous year, and 177,826 in the year 1878-79.

There have been two periods of heavy immigration before, one following the Irish famine, and lasting about eight years, reaching a maximum of 427,833 in 1854 (equal to 17 per cent. increase of our population at that time), and falling off immediately thereafter, becoming smallest in the first two years of the war; the second began at the close of the war, reaching a maximum of 459,802 in 1872-73, which was an addition of 1.13 per cent. to the population. In the 9 $\frac{1}{2}$  years ending with June, 1874, the average number of immigrants yearly was 340,000. From that time immigration fell off rapidly, and reached a minimum of 138,469 in 1877-78.

The vast and unparalleled number of 660,239 immigrants in the year just closed is equal to 1.316 per cent. of the population as enumerated just at the beginning of the year.

The natural increase of the population may be about 2 $\frac{1}{4}$  per cent. yearly, and this would give for the first year since the census an addition of 1,112,000 by births in excess of deaths and 660,000 by immigration, or 1,772,000 in all, bringing up the population on the 1st of July to very nearly 52,000,000. On account of this exceptionally heavy immigration the rate of increase is much above the average.

By far the larger number of the immigrants arrive at New York—last year 400,871 out of a total of 660,239, or 60 $\frac{1}{2}$  per cent., against 58 $\frac{1}{2}$  per cent. the year before. Few would guess the port next in importance; it is Port Huron, whence the passengers by the Grand Trunk cross the border, these passengers being for the most part not Europeans but Canadians, who have been leaving their country at an alarming rate recently.

Last year no less than 111,170 immigrants were credited to "Huron" (the custom-house district, being really Fort Gratiot, at the crossing, two or three miles above Port Huron). The year before there were 94,375.

The other ports with a considerable immigration last year are Boston (41,018), Baltimore (40,017), and Philadelphia (34,865)—these three together not having one-third as many as New York and not one-fifth of the whole number.

In this year of exceptionally rapid growth, one mile of new railroad was built for every 240 added to the population, and the number of persons per mile of railroad in the country was reduced from 566 to 541. Were we to continue to build railroads at the same rate throughout the decade—that is, the same amount, not the same percentage of the total, which would make a vastly greater amount—we would have in 1890 just about 400 people per mile of railroad. Europe having now about 3,300, and Great Britain about 2,000. To pay average gross earnings per mile as large as last year (\$7.307) on such a system would require an expenditure of \$18.26 for railroad transportation per inhabitant, against \$12.27 last year for the 84,225 miles of railroad reporting earnings, of which there was one mile to 596 inhabitants.

To keep up with our present rate of increase in railroad mileage we should require an increase of fully 4,300,000 in population, instead of 1,750,000.

#### The Late W. Milnor Roberts.

Col. W. Milnor Roberts, long recognized as one of the leading civil engineers of America, died in Rio Janeiro, Brazil, July 14, of typhoid fever. At the time of his death he was Chief Engineer of the Public Works of Brazil. Col. Roberts was born in Philadelphia Feb. 12, 1810, and at the age of 15 began his work as a chainman on the Union Canal, of which Canvass White was Chief Engineer, and Sylvester Welch, Locating Engineer. At 18 years of age he was appointed Engineer in charge of the most difficult division of the Lehigh Canal, from Mauch Chunk down 16 miles. His next employment was as Principal Assistant Engineer of the old Philadelphia & Columbia Railroad, and he made surveys of the Portage Railroad across the Alleghenies. After the completion of the Portage



road and the state canal to Pittsburgh, Col. Roberts was chosen Engineer of the Monongahela Navigation Company, and the original surveys and works of that company were made under his direction and supervision. During the administration of Governor Porter, he was appointed Engineer on the Erie Extension of the Pennsylvania Canal, succeeding Dr. Whippoo, of Beaver County. The canal from New Castle to Erie was completed under Col. Roberts' supervision. He was also in charge of the engineering department of the Cumberland Valley Railroad, and not long after Chief Engineer of the Sunbury & Erie, now Philadelphia & Erie Railroad. His next important work was on the Allegheny Valley Railroad, of which he was Chief Engineer, and the surveys of which were made under his direction. He severed his connection with the company after the road had been built as far as Kittanning. Afterward Col. Roberts took charge of the surveys in connection with the construction of the Ohio & Mississippi Railroad, and then the Iron Mountain road, in Missouri. About this time he was appointed by the government Chief Engineer of matters pertaining to the improvement of the Ohio River. In this capacity he made some important reports concerning his labors and observations, and in the improvement of the river committed himself to the use of locks and dams such as are now proposed. About 25 years ago he went to Brazil and was for some time engaged in railroad work there. He was connected at a later period with other important enterprises and was Chief Engineer of the Northern Pacific, Associate Chief Engineer of the St. Louis Bridge and an active member of the Mississippi Jetty Commission. In 1879, at the urgent request of the Emperor Dom Pedro, Col. Roberts returned to Brazil. He was then President of the American Society of Civil Engineers, of which he had long been an active member. Col. Roberts was twice married and leaves three sons (two of whom are engineers) and four daughters. His wife and three daughters were with him in Brazil. He was a man of untiring industry, of singular uprightness and integrity, and of a genial and kindly but somewhat retiring and modest disposition.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

*Eastern.*—The *Chelsea Beach Branch* is completed from Oak Island, Mass., by Chelsea Beach back to the main line at Saugus River, 2 miles.

*Chicago & Northwestern.*—Track laid on the *James River Branch* from Huron, Dak., northward 28 miles.

*Burlington & Missouri River in Nebraska.*—The *Eastern Division, Republican Valley line* is completed by laying track from Endicott, Neb., east to near Wymore, 11 miles.

*Meadville.*—The first track is laid from Linesville, Pa., eastward to Burchard's Mill, 11 miles.

This is a total of 52 miles of new railroad, making 2,615 miles this year, against 2,494 miles reported at the corresponding time in 1880, 1,122 miles in 1879, 900 miles in 1878, 751 miles in 1877, 1,010 miles in 1876, 538 miles in 1875, 839 miles in 1874, 1,872 miles in 1873 and 3,237 miles in 1872. The construction of this year has not yet reached that of 1872.

RAIL IMPORTATIONS into this country have been very large of late months, and for the first half of the year the exports from Great Britain to this country were 157,831 tons this year, against 126,578 in 1880, and 7,730 in 1879. The contrast of this year with 1879, when we took only one-twentieth as many rails from Great Britain, is truly amazing. The total exports this year were sufficient to lay 1,793 miles of track with 56-lb. rails. This year nearly 60 per cent. of the whole are steel; last year little more than half were steel rails.

The exports to the United States in successive months have been:

	1881			1880		
	Steel.	Iron.	Total.	Steel.	Iron.	Total.
January.....	1,705	5,663	7,368	7,350	7,941	15,291
February.....	4,380	10,419	14,799	6,162	6,608	12,770
March.....	14,891	10,829	25,720	4,010	10,518	14,528
April.....	28,050	10,352	38,402	7,075	13,727	20,802
May.....	22,638	17,206	39,844	22,968	6,305	29,273
June.....	21,082	10,616	31,698	16,342	17,572	33,914
Six months.....	92,746	65,085	157,831	63,907	62,671	126,578

If we look at the columns for the total monthly exports in this table, we will see that the large shipments which began in April last year continued, with some increase every month, throughout the half year. On the other hand, this year the exports in June show a considerable reduction (20 per cent.) from those in May. This may be accidental and temporary, but the indications so far are that the domestic supply will not permit imports at a greater rate than we have had already this year. For the past four months this average rate has been 33,916 tons monthly. If kept up at this rate till the end of this year, this will give us a supply of foreign rails amounting to 363,000 tons for the year, which will suffice for 4,125 miles of 56-lb. track. This probably will not be more than half as much as the new road that will be built this year. But last year the requirements for repairs and renewals of old road were nearly three times this amount. In 1880 the imports were very nearly 250,000 tons, or enough for 2,940 miles of new track. The increase thus (on the supposition that imports keep up to the average of the past four months) will only suffice to lay 1,185 miles of new track.

Of the total exports of Great Britain for the first half of this year we have taken seven-eighths of the iron and more than one-third of the steel rails—46 per cent. of its total rail exports. These exports have doubled since 1879, but nine-tenths of the whole increase is in the exports to the United

States. The only other important customers for British rails now are the British colonies, which, in the aggregate, took 105,000 tons against our 157,000 in the last half year. In the aggregate, aside from the United States, other countries took less than in 1880, and but 20,000 tons more than in 1879. The revival in railroad construction in the countries supplied by Great Britain, therefore, has appeared in the United States alone. And Great Britain usually does supply the rails for all European countries except Belgium, France and Germany, and the rest of the world except the United States. It will directly have large quantities to send to Mexico; but hitherto that country has been so unimportant a customer that it has not been reported separately, but classed with the "other countries," which, in the first half of this year, took 32,650 tons.

CHICAGO RAIL SHIPMENTS EASTWARD are reported by the Chicago Board of Trade as 44,971 tons in the week ending July 23, against 50,832 the previous week, 44,371 for the week ending July 9, 55,864 for the week ending July 2, and 72,989 for the week ending June 25—the first of the 15-cent rate. These shipments, as we have explained, always fall short of the actual shipments. For the weeks named they compare as follows:

Week ending—	Actual.	By Board report.	Difference.
June 25.....	81,660	72,989	8,671
July 2.....	67,953	55,864	12,089
" 9.....	56,167	44,371	11,796
" 16.....	62,638	50,832	11,806
" 23.....	52,700	44,971	7,729
* Approximate.			

Thus, the differences have varied from 12 to 36 per cent. of the amounts reported by the Board of Trade.

For the week ending July 16 the actual shipments last year (at just about double this year's rates) were 34,589 tons, showing an increase of 28,049 tons, or more than 80 per cent., this year. For the week ending July 23 the shipments last year were 33,373 tons, and until the middle of October there were only two weeks when the shipments were as much as 40,000 tons. The receipts of grain at Chicago are rather larger than they were a week ago, considerably smaller than at this time last year, but much larger than in any previous year. The extent to which the shipments come from the lake vessels may be judged by the fact that of the total of 44,371 tons reported by the Board of Trade, 26,139 tons were grain, equal to nearly four-fifths of the total shipments last year; and to the fact that the lake rate fell during the week to 2 cents a bushel from 4½ to Buffalo.

The percentages taken by each road by the Board of Trade report were: Chicago & Grand Trunk, 7.6; Michigan Central, 23.9; Lake Shore, 30.6; Fort Wayne, 18.7; Pan-handle, 16.2; Baltimore & Ohio, 3. The Lake Shore and the Pan-handle are largely ahead of their pool percentages, all the others behind; but taking the whole period since June 17 the roads have not varied greatly from their pool percentages, except by the Baltimore & Ohio's avoiding business, or refusing to work for it, as it usually does when rates are unprofitable.

THE POPULAR INTEREST IN PASSENGER TRAFFIC is well illustrated by the interesting and generally reasonable editorial article on "Railroad Competition" which we copy from the *New York Times* of last Tuesday. The *Times* is an unusually well-informed journal, yet this article speaks of the danger of a war over freight traffic following that over passenger traffic, the writer evidently not knowing that the contest over freight has lasted twice as long as that over passengers, that it has resulted in a reduction proportionally as large, and that the losses thereby are several times as great as those by the war on passenger rates. "There are intimations of breaks already in the freight tariffs from the West," says the *Times*; and the intimations are certainly pretty plain, since the railroads have been carrying for six weeks for one-half of what they attempted to establish as the regular spring and summer rate, and one-half of the rate actually received last summer—sometimes for less. The fact is, there is nothing like the same general interest in freight as in passenger rates. Everybody travels more or less; but the number of those who pay freight bills (directly) is comparatively very small. A few hundred people in New York pay the whole freights on grain, flour, provisions and live-stock; the rest of us pay them in the shape of butchers', bakers' and grocers' bills, and never recognize them. But when we hear that the rate to Chicago has been reduced from \$20 to \$8, we remember very plainly how we paid \$20 once, and very many of us reflect whether we cannot take advantage of the low rate to make a tour or pay a visit. The passenger rate is, as it were, the direct tax, which we all see and feel; the freight rate is the custom-house duty, which we do not see, but pay in the form of higher prices, etc.

THE EFFECT OF THE LOW RATES ON TRAFFIC must not be judged by the Chicago shipments alone. Chicago and Milwaukee are almost the only points where shipments can be increased by diverting traffic from the lakes. We have followed the Chicago shipments closely, and they have been very much larger than in the corresponding weeks of last year—from 21,000 to 28,000 tons a week larger. For the four weeks following the reduction of the rail rates to 15 cents per 100 lbs., the rail shipments from Chicago were 268,418 tons this year against 171,301 tons in the corresponding four weeks of last year, showing an increase of 57 per cent. One might suppose, therefore, judging by this alone, that in gross earnings the loss by the low rate was nearly made up by the increase in shipments.

The shipments of the whole West are not equally accessible, but complete records are kept of the total shipments

over the trunk lines of freight delivered to them at Buffalo, Pittsburgh, etc., by the western roads—that is, of all the east-bound traffic for which the trunk lines compete. Now for the four weeks above mentioned the increase in this the total east-bound traffic was only *seven and a half* per cent. over last year's shipments, against the 57 per cent. increase at Chicago, and the amount of the increase was not equal to two days' traffic! Thus for every 1,000 tons carried last year on the basis of a 30-cent rate, the roads this year have carried 1,075 tons on the basis of a 15-cent rate (or less), and their earnings from this traffic must have been about in the proportion of 161 this year to 300 last. We commend this to those who think that there is not much lost by the low rates.

BETTER LIGHTING OF CARS is suggested by the description of an improved gas apparatus which we publish this week. It seems strange that with all the great efforts and great expenditures that have been made of late years to make certain cars as elegant and luxurious as possible, the luxury of light, universally recognized in home and public parlors, has been so generally ignored. A traveler is given a richly upholstered and ornamented car to ride in, whose beauties for several hours in the evening he can hardly see; and as for reading, only those who risk early blindness attempt that. It may be true that the average passenger doesn't mind it much, and the average car, doubtless, will continue to be made to suit the average passenger. But we suspect that the average passenger cares more for good light than is suspected, and will value a well-lighted car more than some of the superfine carpets, upholstery, curtains and silver-plating with which it is the fashion to entice him. The Metropolitan Elevated has made a very great improvement on the ordinary light; but the four or six large oil burners which it uses do not yet give quite light enough.

CROP PROSPECTS have grown poorer. Interest is now concentrated in Minnesota and Dakota, the harvest being finished in all the winter wheat states except possibly in parts of Michigan. Southern, or at least Southeastern Minnesota will certainly have a poor wheat crop. Here, however, wheat has not been good for some time, and less and less is sown every year; other crops, and especially stock, being substituted. In Southwestern Minnesota, which is new and growing fast, the prospect is of a better, but apparently not of a good crop; in the part of Dakota next west, that is, south of the Chicago & Northwestern's line, there seems to be a fair prospect. Further north, in the Red River Valley, reports are not definite, but not discouraging until we get further west, to the James River Valley and beyond, where drought is said to have made the crops light. It should be remembered, however, that until this year there has been very little wheat sown so far west, not enough to have any considerable effect on the total crop of that territory even.

WATER RATES have again changed, lake rates falling half a cent to 2 cents a bushel for corn from Chicago to Buffalo. Canal rates for two or three days were ½ cent higher, but fell again and since Sunday have been as we last reported, 4 cents for corn and 4½ cents for wheat from Buffalo to New York. A through rate of 6½ cents is reported from Chicago to New York, against 8.4 by rail (at 15 cents per 100 lbs.).

Ocean rates have risen about two cents a bushel, and Wednesday were quoted at 5½d. from New York to Liverpool by steam. It now costs just about as much to send a bushel of grain from Chicago to Liverpool as before the railroad war began. Then the rate by lake and canal was about 9½ cents from Chicago to New York and the ocean rate 7 cents; now the ocean rate is 11 cents and the lake and canal rate 6½.

DOCTOR OF DIVINITY is not the title which we would expect a railroad man to sport; but it is reported that a California college recently granted that degree to the General Baggage Agent of the Central Pacific Railroad. We must expect hereafter that the baggage business of the Central will be conducted with religious care; and that fewer little d—ds be conferred on the subordinates of the General Baggage Agent by wrathful passengers.

#### The Future of the Steel Trade.

At a time when no other branch of the great iron industry of this country is so prosperous as the steel trade, it may appear somewhat out of season to indulge in speculation as to its future. It is not likely that those who are busy in a struggle to supply the requirements of the day should show much concern as to the aspect which affairs may present at a period more or less remote. Our steel mills have now as much business as they can attend to in the shape of rail orders, which tax their machinery to the breaking point, and the confidence of their managers as to prospective calls upon their works for material is sufficiently proven by the preparations going on at almost every Bessemer mill in the country to increase capacity. We believe that a calm and unprejudiced survey of the trade and its future will justify their course. We have become too much accustomed in this country to identify the production of Bessemer steel with the manufacture of rails, and many are inclined to view with apprehension an expansion which, to the ordinary observer, appears out of all proportion to the probabilities of a continuation of the present demand. We know that the present demand for rails is exceptional. There is no reason to believe that railway building will continue at the present rate indefinitely, and it is to be expected that our railroads will soon have completed the repairs which had accumulated during the long period of depression after 1873. Those who are acquainted with our railroad system do not expect that it will absorb regularly, for any length of time, the enormous quantities of metal which have gone into it during the past two years. Naturally, the question comes up, What are the mills going to do with a plant whose capacity is rapidly doubling? A review of the course of events abroad will aid us in finding an answer



o this question, which seems to deserve greater attention on the part of the trade at large than it has thus far received. From all appearances the steel manufacturers are really least interested in it.

In England, Bessemer steel has virtually usurped the place formerly occupied by iron as a material for the manufacture of rails. It may be urged that in this direction much remains to be done in this country. In the census year 1880, American works turned out 467,000 net tons of iron rails. While, therefore, the rail trade abroad is practically limited to steel, here it is still divided, with a fair proportion in the hands of iron mills. The main cause for this we conceive to be that many of our roads with a light traffic, empty treasuries and small revenues, are forced to adopt the policy of buying the cheapest rails, even though in the long run it may prove less economical. The question is one of price, and any depression in trade would tend to bring the quotation of iron and steel rails closer together, because the makers of the latter are much better able to make reductions than those of the former. Increased capacity of the steel mills and the lower prices growing out of a slack demand would, therefore, rapidly bring our iron rail trade to the condition approaching that in England, where it is practically extinct.

During the next few years the positions of buyers and sellers of steel rails are likely to be reversed. Now the pressure of orders taxes the mills. Then the mills will be more than able to meet the requirements of a reduced consumption, and will be forced to look for orders. In England they are now passing through this stage, and we shall soon reach it. The British steel rail production is far beyond the capacity of the rail market, and the Bessemer works are beginning to struggle for recognition in other fields—notably those which have hitherto depended on the product of the open-hearth process. Among consumers there is a general impression that the open-hearth steel, though more costly, is preferable because it affords some assurance of uniformity in quality—a point upon which experience has justified some misgivings as far as any steel is concerned. In experimenting with a new material, a due regard for safety makes the price a matter of secondary importance. It is thus that in England steel, but almost exclusively open-hearth metal, is rapidly gaining ground as a material for shipbuilding, and both it and Bessemer metal are finding more extended use in boiler plates. While the experimental stage has not yet been passed, and a number of practical questions concerning adaptability to special purposes are pressing for a solution, the indications are that the favor with which homogeneous metal is being received is such that a relatively larger reduction in price will obtain for it many new friends. To some extent it is an important matter to American ironmasters and engineers that this competition is being decided abroad, and that we can learn much from the experience gained there without paying for it. Just what the relative position of wrought iron and steel will be, must depend upon conditions the importance of which we cannot now gauge. That will ultimately be settled by considerations of quality and of cost. In this country, on the whole, the development of the steel industry will be slower than it has been abroad. Our Bessemer works will, however, be forced, at no distant time, to turn with greater attention to the manufacture of merchant steel, and, as the use of metal for shipbuilding purposes is comparatively limited in this country, one step in the development of the steel trade in England will be passed by. They will have to turn at once to the making of boiler plate, channels, tees and angles, and the many forms used for structural purposes. In some of these branches open-hearth steel will prepare the way and may continue to hold the market, but in time even this must yield to the competition of the converter. The belief is quite general that the latter cannot be as well controlled as the former, and that it is difficult to secure uniformity of quality. In this respect its capabilities have been much underrated, and its range, so far as quality and independence of special grades of metal are concerned, has been much widened by the discovery of the basic process.

Harassed as they are by continued labor disputes, handicapped often by insufficiency and poor construction of plant and lack of resources and capital, many of our iron mills must go under in the coming struggle. It will not do to argue that, because the ironroads upon their territory have thus far been unimportant and have developed very slowly, there are as many years before them as they have enjoyed in the past. The critical period, long delayed by circumstances, is seemingly nearer than the iron trade are inclined to believe. A longer lease of life may be granted to the weak by the fact that the Bessemer interest is in the hands of a peculiarly organized syndicate, whose action no one can foretell; but it should not be forgotten that the association has by no means exclusive control of the Bessemer process, and that capitalists, if once aroused to the possibilities of the future of the trade, will rush into the business and build new works, until the domestic competition shall become more serious than foreign competition ever even threatened to be. At the present time the immediate outlook for those in the iron trade is not alarming, but it is the part of prudence to look into the future; and the ironmaster who shuts his eyes to the fact that steel is destined to displace iron to a great extent in the not remote future, will find himself but poorly prepared for the changes when they come. He does not need to be told that the preparations of the Bessemer works to increase their production to something like 1,750,000 tons of ingots in 1882, does not mean that they expect their rail orders to go on increasing forever. They are much too wise for this. And when he discovers just what this increase does mean, he will, if he looks close enough, see that they have good reasons for their faith in the future.—*The Iron Age*, July 7.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Meetings.

Meetings will be held as follows:  
*Cleveland, Columbus, Cincinnati & Indianapolis*, special meeting (to vote on the agreement of consolidation with the Cincinnati, Hamilton & Dayton Company), in Cleveland, O., Sept. 1, at 10 a. m.

*Columbus & Hocking Valley*, special meeting, in Columbus, O., Aug. 2, to vote on an agreement of consolidation with the Columbus & Toledo and the Ohio & West Virginia. Special meetings of the other companies will be held on the same date.

*Cairo & Vincennes*, special meeting, in Cairo, Ill., Sept. 15, to ratify the sale of the road to the Wabash, St. Louis & Pacific Company.

*Texas & Pacific*, annual meeting, at the office, No. 195 Broadway, New York, Aug. 9, at noon. Transfer books close Aug. 5.

#### Dividends.

Dividends have been declared as follows:  
*Boston & New York Air Line*, 1 per cent. on the preferred stock, payable Aug. 30. Transfer books close Aug. 10.

*St. Paul, Minneapolis & Manitoba*, 3 per cent., semi-annual, payable Aug. 1. Transfer books closed July 20.

*Terre Haute & Indianapolis*, 4 per cent., semi-annual, payable Aug. 1.

*Bald Eagle Valley* (leased to Pennsylvania Railroad Company), 4 per cent., semi-annual.

*Cedar Rapids & Missouri River* (leased to Chicago & Northwestern), 3½ per cent. on preferred and 1½ per cent. on common stock, payable Aug. 1.

#### Foreclosure Sales.

The *Florida Central* road will be sold in Jacksonville, Fla., Oct. 14, under the decree of the United States Circuit Court. The sale will include the road from Jacksonville to Lake City, 59 miles, and all appurtenances, and will be for cash. The road has been the subject of prolonged litigation and is now sold to satisfy the lien of the Dutch bond holders.

The *Fl. Wayne, Muncie & Cincinnati* road was to be sold July 27. It extends from Ft. Wayne, Ind., to Connersville, 108 miles, and has been in the hands of a receiver several years.

#### Wisconsin Freight Agents' Association.

The Wisconsin Freight Agents' Association has just been formed, having as its main object the monthly discussion of subjects of common interest to railroad freight officers. The Association, at these regular meetings, intends paying particular attention to a uniformity of classification, for the purpose of facilitating the interchange of traffic over the most convenient routes. It includes in its membership the traffic managers and heads of freight departments on the following Wisconsin roads: Chicago, Milwaukee & St. Paul; Chicago & Northwestern; Wisconsin Central; Milwaukee, Lake Shore & Western; Chicago, Minneapolis, St. Paul & Omaha, and Green Bay, Winona & St. Paul.

#### ELECTIONS AND APPOINTMENTS.

*Atchison, Topeka & Santa Fe*.—Mr. C. C. Wheeler has been appointed General Manager in place of Mr. Wm. B. Strong, lately chosen President. Mr. Wheeler has been for a number of years with the Chicago & Northwestern, and for some time past has been Assistant General Manager of that road.

*Atlantic & Ohio Telegraph*.—This company has elected Norvin Green President; Augustus Schell, Vice-President; R. H. Rochester, Secretary and Treasurer. The lines are leased to the Western Union.

*Chicago, Milwaukee & St. Paul*.—Mr. L. B. Beardsley has been appointed Superintendent of Sleeping Cars, a new office.

Mr. H. W. McNeill has been appointed Superintendent of the Mining and Fuel Department, and will have charge of all mining operations and of the supply and distribution of fuel on the company's lines.

*Evansville & Terre Haute*.—The board has been reorganized and is now as follows: E. S. Babcock, Jr., F. Heakes, D. J. Mackey, Evansville, Ind.; J. G. English, Danville, Ill.; A. S. Dunham, F. W. Huidekoper, D. L. Patterson, Chicago; George W. Gill, Worcester, Mass.; F. H. Story, Boston; A. G. Astin, I. N. Brockman, E. Chase, J. T. Clark, New York. The board elected F. W. Huidekoper President. The company is now controlled by the Chicago & Eastern Illinois.

*Hastings & Stillwater*.—The officers of this new company are: President, D. M. Sabin; Vice-President, S. S. Merrill; Secretary, P. M. Myers; Treasurer, John Johnston. The road is owned by the Chicago, Milwaukee & St. Paul Company.

*Illinois Central*.—Mr. C. A. Beck has been appointed Assistant General Superintendent (a new office) and will have his headquarters in Chicago.

Mr. T. J. Hudson has been appointed Superintendent of the Chicago Division, in place of Mr. Beck, promoted. Mr. Wm. Wilkinson succeeds Mr. Hudson as Superintendent of the Springfield Division. Mr. H. L. Frisbie is made Superintendent of the Middle Division in place of Mr. Wilkinson.

*International & Great Northern*.—Mr. Joseph Hurion is appointed Superintendent of the San Antonio Division, which will include the road from Palestine to San Antonio and Laredo, with all branches. Office at San Antonio, Tex.; Mr. R. B. Pegram is appointed Superintendent of the Gulf Division, including the line from Longview to Houston and from Houston to Columbia, with all branches.

*Jacksonville, Pensacola & Mobile*.—Mr. Calvin H. Allen, formerly Receiver, is now in possession of this road as Manager for the purchasing bondholders. It is understood that he will be President of the new company.

*Lake Erie & Western*.—The following circular is dated LaFayette, Ind., July 18:

"Mr. E. J. Waldron is hereby appointed Assistant General Freight Agent of this company, to take effect Aug. 1, 1881, with office at LaFayette, Ind. On and after date named, all communications regarding the local business of the road should be addressed to him."

*Memphis, Salem & Brunswick*.—This company has been organized with the following officers: President, Frederick Wolfe; directors, Thomas R. Koulac, Greensboro, Ala.; A. W. Jones, C. M. Shelly, Selma, Ala.; Charles E. Lewis, J. C. Seligman, John Travers, Jr., W. R. Travers, New York; Secretary and Treasurer, M. Calin; Assistant Secretary and Treasurer, W. T. Crenshaw.

*Mexican Oriental, InterOceanic & International*.—The directors of this company are: John F. Dillon, Sidney Dillon, G. M. Dodge, Thomas T. Eckert, Jay Gould, Ulysses S. Grant, Norvin Green, Russell Sage, New York; Francis M. de Grass, Mexico.

*New Orleans, Little Rock & St. Louis*.—This company has been revived and reorganized. Its office is in Little Rock, Ark. The officers are: President, Logan H. Root; Secretary, J. N. Smith; Treasurer, W. B. Worthen; Executive Committee, J. D. Adams, J. N. Smith, W. B. Worthen.

*New York, Lake Erie & Western*.—The following order from President Jewett is dated July 13: "I, C. G. Barber, Assistant to the President, is specially charged with the duty of conducting the correspondence of the President, and of examining into and advising with respect to the management and condition of the finances, the business and traffic of the company, and particularly of its earnings, expenses, accounts, obligations, contracts, and such other matters as may from time to time be assigned him. All officers, agents and employees of the company when required will furnish him such information as lies in their power."

"C. C. Waite, Assistant to the President, is specially charged with the duty of examining into and advising the President with respect to the management and condition of the physical properties and operations of the company, and particularly of its railroads and branches, its cars, motive

power, supplies, depots, shops and yards, its collieries and coal lands, its docks and harbor facilities, its tugs, barges and vessels, and all construction work in contemplation or progress. All officers, agents and employees of the company when required will furnish him such information as lies in their power."

*Ontario & Quebec*.—The officers are: President, A. B. Osler, Toronto, Ont.; Chief Engineer, M. Lumsden.

*Ontonagon & Brule River*.—The board has elected officers as follows: President, Ezra Rust, East Saginaw, Mich.; Secretary and Attorney, E. Marriner, Milwaukee, Wis.

*Pennsylvania Company*.—Mr. E. A. Ford, General Passenger Agent of the Pennsylvania Company, the Pittsburgh, Cincinnati & St. Louis and the Vandalia Line, announces the following organization of the Passenger Department of those companies:

Reporting directly to the General Passenger Agent: Chief Assistant General Passenger Agent Henry Monett, Pittsburgh; Assistant General Passenger Agents C. W. Adams, Chicago; C. C. Cobb, Cincinnati; J. M. Chesbrough, St. Louis; Pacific Coast Agent J. B. Kirkland, San Francisco.

Reporting to Mr. Monett: District Passenger Agents Thomas E. Watt, Pittsburgh; C. L. Kimball, Cleveland; E. O. Francisco, Toledo; Traveling Passenger Agent Fred. Huseman, Wheeling, W. Va.

Reporting to Mr. Adams: Southwestern Passenger Agent H. L. Hall, St. Joseph, Mo.; Colorado Passenger Agent J. G. Ruple, Denver, Col.; Western Traveling Agent S. M. Demmond, Omaha, Neb.; Traveling Passenger Agents W. H. Willoughby, St. Paul, Minn.; F. A. Madera, Madison, Wis.; J. G. Manlove, Springfield, Ill.; City Passenger Agents Albert Geierling, Milwaukee; G. W. Metzger, Chicago; City Advertising Agent G. B. White, Chicago.

Reporting to Mr. Cobb: District Passenger Agents Frank M. Caldwell, Columbus, O.; Robert Emmett, Indianapolis; Southern Traveling Agent Sidney B. Jones, Louisville; Southern Passenger Agent W. M. Wallington, New Orleans; Southeastern Passenger Agent John B. Wrenn, Atlanta, Ga.; Southern Advertising Agent E. F. Black, Nashville, Tenn.; Texas Passenger Agent Thomas S. Spear, Dallas, Tex.; Traveling Passenger Agent J. G. Manlove, Springfield, Ill.; City Passenger Agent G. M. Gibson, Local Passenger Agent Robert Air, River Passenger Agent Wm. Robinson, Cincinnati.

Reporting to Mr. Chesbrough: District Passenger Agent Robert Emmet, Indianapolis; Western Passenger Agent G. H. Baxter, Kansas City, Mo.; Colorado Passenger Agent J. G. Ruple, Denver, Col.; Texas Passenger Agent Thomas S. Spear, Dallas, Tex.; Traveling Passenger Agent W. D. Wetherell, St. Louis; City Passenger Agent Wm. Forsythe, St. Louis.

Reporting to Mr. Watt: City Passenger Agent W. C. Rinearson, Traveling Advertising Agent W. B. Shafter, Local Passenger Agent G. G. Beltzhoover, Local Advertising Agent W. A. McGuire, Pittsburgh.

Reporting to Mr. Caldwell: Passenger and Ticket Agent Benjamin Monett, Jr., Columbus, O.; Traveling Passenger Agents Wm. Hunter, Dayton, O.; J. J. Mohler, Zanesville, O.; George E. Monett, Chillicothe, O.

Reporting to Mr. Emmett: City Passenger Agent E. W. Cartwright, Traveling Passenger Agent A. W. Campbell, Local Passenger Agent George Gaston, Indianapolis.

Reporting to Mr. Kimball: Traveling Passenger Agents E. L. Pardee, O. D. O'Brien, Cleveland, O.

Reporting to Mr. Francisco: Michigan Passenger Agent C. H. Norris, Detroit.

"Mr. Ruple will report to Mr. Adams, in all matters pertaining to Ft. Wayne Route, via Chicago; and to Mr. Chesbrough, in all matters pertaining to Vandalia and Pan-Handle Route, via St. Louis.

"Mr. Manlove will report to Mr. Adams, in all matters pertaining to Ft. Wayne Route, via Chicago or Ft. Wayne; and to Mr. Cobb in all matters pertaining to Pan-Handle Route, via Logansport, Indianapolis or Cincinnati.

"Mr. Emmett will report to Mr. Cobb in all matters pertaining to Pan-Handle Route; and to Mr. Chesbrough in all matters pertaining to Vandalia Line.

"Mr. Spear will report to Mr. Chesbrough in all matters pertaining to Vandalia and Pan-Handle Route, via St. Louis; and to Mr. Cobb in all matters pertaining to Pan-Handle Route, via Louisville or Cincinnati.

"Each Assistant General Passenger Agent will immediately assign working districts for all agents who are required by these instructions to report to him, and furnish the General Passenger and Ticket Agent with an accurate description of the territory of every agent so assigned. Each district passenger agent will report to his Assistant General Passenger Agent the assignment of territory made to each subordinate agent."

*Pennsylvania & Martin's Creek*.—The directors of this company are: David W. Howell, Martin's Creek, Pa.; C. C. Cokefair, S. L. Fidler, Thomas L. McKean, Easton, Pa.; E. F. Browning, C. C. Gilman, Hiram D. Faulkner, New York.

*Philadelphia, Wilmington & Baltimore*.—The reorganized board has elected Isaac Hinckley President; A. J. Cassatt, Vice-President; Frank Thomson, General Manager; Robert Craven, Secretary and Treasurer; H. F. Kenney, Superintendent. Messrs. Cassatt and Thomson are also officers of the Pennsylvania Railroad; the others are continued in office, Mr. Craven being made Secretary as well as Treasurer.

*Susquehanna, Pittsburgh & Western*.—The officers of this new company are: President, James S. Negley, Pittsburgh, Pa.; directors, H. E. Collins, H. T. Hanna, Frank Henning, James S. Negley, Jr., Wm. N. Riddle, Pittsburgh; Deios E. Culver, Charles Siedler, Jersey City, N. J.; F. W. Lockwood, New York.

*Utah Central*.—Mr. Francis Cope has been appointed General Freight and Passenger Agent of the consolidated line, including the Utah Southern.

*Vermont & Boston Telegraph*.—At the annual meeting at White River Junction, Vt., July 27, the following were chosen: President, Norvin Green; directors, O. H. Palmer, David H. Bates, Norman Williams, G. W. Gates, H. C. Sherman, G. W. Smith, Thomas Roche, R. H. Rochester; Secretary and Treasurer, R. H. Rochester. The company is controlled by the Western Union.

*Texas & St. Louis*.—Wm. A. Gavett having resigned as General Freight and Passenger Agent of this company, Mr. John H. Perry is appointed Acting General Freight and Passenger Agent from July 22.

*Union Pacific*.—Mr. Geo. W. Keeler is appointed Passenger and Immigration Agent for this company, with headquarters at No. 287 Broadway, New York. Appointment to take effect Aug. 1, 1881.

*Wabash, St. Louis & Pacific*.—Chicago papers report that Mr. W. F. Merrill, Superintendent of the Peoria & Iowa Division, will have charge of the Chicago Division also, and that his office will be removed from Peoria to Chicago.

*Wisconsin Freight Agents' Association*.—The officers of the association are as follows: President, T. H. Malone, Wis.



consist Central; Vice-President, D. W. Keyes, Chicago, Milwaukee & St. Paul; Secretary, L. Blankenhorn, Chicago, Milwaukee & St. Paul; Treasurer, C. H. Knapp, Chicago & Northwestern.

## PERSONAL.

—Mr. John I. Blair, in announcing his withdrawal from the presidency of the Susquehanna Railroad Company, refers to his increasing age and infirmities. Mr. Blair is, we believe, about 50 years old, but is still an active and vigorous man, and can take a trip from his New Jersey home out to Iowa and back with little apparent fatigue.

—Mr. Thomas T. Firth died July 22 at his residence in Germantown, Pa., from heart disease, aged 76 years. Deceased was born in Salem, N. J. In early life he was bookkeeper in the house of Lippincott, May & Wolcott, Philadelphia, a position which he filled with marked ability for a number of years. In the year 1850 he was chosen Secretary of the Pennsylvania Railroad Company, and in the course of a few years was elected Treasurer thereof. He held this position until succeeded by Edmund Smith, the present financial Vice-President of the corporation. Upon his resignation from the position of Treasurer, Mr. Firth was elected Secretary and Treasurer of the sinking fund of the company, from which he withdrew last April on account of impaired health.

## TRAFFIC AND EARNINGS.

## Railroad Earnings.

Earnings for various periods are reported as follows:

	1881.	1880.	Inc. or Dec.	P. c.
<b>Six months ending June 30:</b>				
Min. & St. L.	\$77,073	\$31,100	I.	\$167,573 57.3
Mo., Kan. & Tex.	2,289,933	1,580,845	I.	223,078 11.3
Northern Central	2,894,868	2,217,791	I.	444,077 20.0
Net earnings	1,010,462	688,715	I.	351,747 51.1
Pennsylvania	21,553,839	19,434,071	I.	2,119,768 10.9
Net earnings	8,907,154	8,094,407	I.	902,747 11.2
<b>Month of June:</b>				
Min. & St. L.	\$144,478	\$72,809	I.	\$71,669 98.5
Northern Central	487,287	419,193	I.	68,094 46.3
Net earnings	181,601	143,227	I.	38,374 26.8
Pennsylvania	3,807,437	3,221,474	I.	585,961 18.2
Net earnings	1,488,543	1,012,247	I.	476,296 47.1
Phil. & Reading	1,707,296	1,308,539	I.	398,757 30.5
Net earnings	708,469	653,959	I.	54,510 8.3
<b>First week in July:</b>				
Gal., Har. & San Antonio	\$21,176	\$20,190	I.	\$977 4.9
<b>Second week in July:</b>				
Chi. & East. Ill.	\$28,483	\$21,237	I.	\$7,246 34.1
Chi. & N. W.	415,009	369,539	I.	45,470 12.3
Chi., St. P., Minn. & O.	89,497	54,601	I.	34,896 63.3
St. L., I. M. & S. P.	133,000	112,667	I.	20,333 18.0
Wabash, St. L. & P.	268,132	274,962	D.	6,830 2.5
<b>Third week in July:</b>				
Louis. & Nash.	\$192,400	\$169,500	I.	\$22,900 13.5
Northern Pacific	105,540	54,481	I.	51,059 93.6
<b>Week ending July 15:</b>				
Great Western	\$104,395	\$90,878	I.	\$13,517 12.9
<b>Week ending July 16:</b>				
Chi. & Gr. Trunk	\$25,647	\$18,291	I.	\$7,356 40.9

## Pacific Through Freight.

Shipments of through freight eastward over the Central Pacific in June were: San Francisco, 9,436 tons; interior points, 2,249 tons; total, 11,685 tons, an increase of 71.7 per cent. over June of last year. Leading items of freight were 2,548 tons wool, 1,807 tons tea and 1,511 tons salmon.

## Grain Movement.

For the week ending July 16 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874	2,101,671	349,907	16.5
1875	3,090,789	413,377	18.5
1876	3,064,638	413,377	18.5
1877	2,938,546	3,302,150	1,032,825 31.3
1878	4,136,595	3,233,327	583,147 18.0
1879	4,300,000	3,005,508	1,347,944 43.5
1880	4,379,964	3,391,332	1,451,029 36.3
1881	5,798,132	5,383,749	1,137,390 21.1
1882	5,103,048	5,302,418	2,380,333 45.0

Though the movement for the week is less in all particulars than in the corresponding week last year, it is unusually large for this time of year. Compared with the previous week this year there is a small falling off in Northwestern receipts, one of 15 per cent. in Northwestern shipments and one of 28 per cent. in Atlantic receipts. The latter at this time were swelled by arrivals of new winter wheat from the Ohio Valley and other points south of those which are likely to send grain to the lake ports. The shipments by rail are a trifle more than the week before, and more than twice as great as in the corresponding week of last year. Besides these, 84,044 bushels, or 1.4 per cent. of the whole, went down the Mississippi—the smallest week's shipments by this route since the river opened last February. The lake shipments also are the smallest since navigation opened and not very much greater than the rail shipments. This had the effect of reducing lake rates materially last week.

Of the Northwestern receipts Chicago had 63.1 per cent., St. Louis 12.6, Peoria 9.4, Milwaukee 5.8, Toledo 5.6, Cleveland 2.4, and Detroit 1.1 per cent. Chicago is getting an extraordinarily large proportion of the receipts, and St. Louis, though only about half as much as it was getting before the low rates were made, still has more than last year at this time.

Of the Atlantic receipts, New York had 50.8 per cent., Baltimore 14.9, Philadelphia 11.4, Boston 9.9, Montreal 6.7, New Orleans, 6.1, and Portland 0.2 per cent. Baltimore and Philadelphia do a little better than the week before, but still together received only half as much as New York.

Exports from Atlantic ports for five successive weeks have been:

	July 10.	July 13.	July 16.	June 29.	June 22.
Flour, bbls.	7,795	82,019	63,348	64,313	59,015
Grain, bush.	4,408,079	4,141,783	3,773,376	4,839,032	3,457,710

For the week ending July 22 receipts and shipments at Chicago and Milwaukee have been:

	Receipts.	Shipments.
1881.	2,748,368	3,102,217
1880.	3,046,610	3,728,093
Chicago.	286,005	341,313
Milwaukee.	155,605	250,360

In the aggregate both receipts and shipments were smaller this year than last.

For the same week receipts and shipments at Buffalo were:

	Receipts.	Shipments.
1881.	2,066,500	1,260,350
1880.	2,909,970	2,071,730
By rail.	1,278,100	1,131,400
By water.	788,400	939,330
Total.	3,344,900	4,041,370

Thus there was a decrease of 29 per cent. in lake receipts,

but an increase of 13 per cent. in rail receipts; and a decrease of 39 per cent. in canal shipments, with an increase of 33 per cent. in rail shipments.

Receipts at four Eastern ports for the same week ending July 22 were:

	New York.	Boston.	Phila.	Baltimore.	Total.
1881.	3,361,126	316,445	1,598,450	1,037,710	6,313,731
P. c. of total.	55.0	5.2	22.8	17.0	100.0
1880.	4,343,004	266,301	1,133,440	2,588,328	8,331,073
P. c. of total.	52.1	3.2	13.6	31.1	100.0

The change in percentage is chiefly due to the great decrease at Baltimore. Its receipts for the week last year were perhaps the largest it has ever had, and were due to the marketing of the great and unusually early winter wheat crop from the country which lies directly on the lines with closest connection with Baltimore. The receipts of Philadelphia this year are unusually large.

Of New York's receipts this year 1,077,466 bushels, or 32 per cent., were by canal.

## Chicago and Milwaukee Receipts.

Receipts of grain, flour and hogs at Chicago and Milwaukee for the three weeks ending July 21 have been, for four years:

	1878.	1879.	1880.	1881.
Chicago:				
Grain, bu.	6,574,077	6,818,959	8,448,818	10,912,811
Flour, bbls.	12,134	12,134	12,134	12,134
Hogs, No.	224,213	203,904	364,512	376,718
Milwaukee:				
Grain, bu.	1,292,822	816,618	496,158	516,954
Flour, bbls.	110,700	119,475	129,528	225,747
Hogs, No.	9,918	7,901	12,897	25,167

Including flour the receipts of these two Lake Michigan ports were no less than 42 per cent. greater than those of the corresponding three July weeks last year, when they were much larger than ever before. There is, however, a great falling off in grain at Chicago in the last week of the three in this year. The receipts in the first, the second and the third weeks of July have been, respectively:

	1878.	1879.	1880.	1881.
First week	2,135,682	2,839,306	2,716,212	4,636,907
Second	1,852,181	1,765,214	2,461,505	3,411,233
Third	2,588,214	2,184,349	3,271,101	2,865,671

Thus this year there has been a decrease weekly in the receipts, which is common every year when the farmers become absorbed by their harvesting work, but comes earlier or later according to the season, and also depending on the extent to which the last year's grain has been marketed.

## Coal Movement.

Coal tonnages for the week ending July 16 are reported at follows:

	1881.	1880.	Increase.	P. c.
Anthracite	685,532	393,340	292,192	74.4
Semi-bituminous	105,738	76,617	29,121	40.4
Bituminous, Penna.	58,196	30,646	27,550	90.0
Coke, Penna.	42,907			

The anthracite trade is unusually good for the season. Bituminous trade is also improving generally, and is very good for a week in midsummer.

## Alabama Commission Rates.

On Wednesday the Railroad Commission revised the passenger and freight tariffs of the Selma, Rome & Dalton Railroad and the Alabama Central Railroad. The passenger tariff on the Selma, Rome & Dalton Railroad was reduced to three cents a mile with ticket, and four cents a mile without a ticket; and the freight tariff on this road in the average reduction made by changes was about 20 per cent. The passenger tariff on the Alabama Central Railroad was reduced to four cents a mile with ticket and five cents without ticket; and the freight tariff on this road in the average reduction made by changes was about 30 per cent.

Yesterday the Commission revised the tariffs of the Western Railroad Company of Alabama. The passenger tariff on this road was reduced to three cents a mile with ticket, and four cents a mile without ticket, and the freight tariffs on this road, in the average reductions made by changes, was about 10 per cent.

The Memphis & Charleston Railroad Company, on account of the necessary absence of its Assistant General Freight Agent, Mr. T. S. Davant, in New York, asked a few days to collect and lay before the Commission additional information upon the subject of its freight business, before its tariffs are revised by the Commission, which was granted.

Reductions to the extent named in freight tariffs of each of these roads does not go to every separate article. In some instances the Commission adopted the figures of each of the companies as to certain articles of freight, but upon most articles reduced them, some more and some less. These changes in all their details are too voluminous to be made the subject of a newspaper article.

The Commissioners allowed 15 days to print revised tariffs of these companies, and then to be presented to them for examination and certificate; and in furnishing a copy of each of these changes to officers of these companies present, the Commissioners gave them notice that these revised tariffs must go into force on the 1st day of next September.—Montgomery (Ala.) Advertiser, July 22.

## West-Bound Passenger Rates.

The cutting of passenger rates continues, and on July 27 tickets from New York to Chicago were sold at \$7.50 and in the afternoon at \$7 at the railroad offices, the outside or "scalpers'" offices going a little lower.

The Boston & Albany and the Fitchburg companies have agreed to keep Boston rates \$1 to Chicago above New York rates. The Grand Trunk, however, is said to be carrying passengers from Boston to Chicago for \$5, and to threaten to go lower still.

## RAILROAD LAW.

## Fixing Rates by United States Courts.

Judge McCrary has recently made a decision in the Eastern District of Arkansas which contains some suggestions that will, we fancy, be both novel and interesting to railroad men. The case was one brought by the Southern Express Company against the Memphis & Little Rock Railroad, to prevent the latter excluding the former from the transaction of business on its line. The Judge decided that the road was bound to carry for the express company, and must not discriminate against it either in favor of itself or of other express companies; but he added the following significant remark: "I am not prepared now to fix the maximum rates to be charged for the transportation of express matter; but I have no doubt of the power of the Court after investigation to do so. An order for this purpose should not, as a rule, be made until after a reference to a master, and a report by him after a hearing." But why should the report be only on maximum rates? or why should it be confined to express companies? It is obvious that it could not be so confined in practice, for Judge McCrary's decision goes upon the ground that express companies stand upon the same footing with other customers of the

road. If the Courts' aid were once called in to fix maximum rates for them, it must soon be used for the purpose of fixing all rates, for freight and for passengers as well. In fact, the judge would have to run the railroad, see that the crops were "carried to tide water," "cut rates" when necessary, extirminate "scalpers," "consolidate" and "pool earnings," with other judges. Probably some of the courts would develop greater talent in railroad management than others, and this would produce judicial Jay Goulds and Vanderbilts, after which we should have to begin over again with new remedies.—New York Evening Post.

## THE SCRAP HEAP.

## Locomotive Building.

The Delaware, Lackawanna & Western shops at Kingston, Pa., last week turned out a new Mogul engine with 19 by 24 in. cylinders and 4½ ft. driving wheels. This is the third engine of this class built at these shops; another one is nearly finished and still another has been begun. These engines have been designed by Master Mechanic Charles Graham for the heavy freight service of the Bloomsburg Division, and those now in service have given great satisfaction. These engines weigh 45 tons each.

The Pennsylvania Railroad shops at Altoona have just completed the last of eight "Class K" heavy passenger engines for the fast work on the New York Division. These engines have wrought-iron driving wheels from the Krupp Works in Prussia. Work has been begun on several consolidation and "Class B" passenger engines.

The Manchester Locomotive Works, at Manchester, N. H., are just finishing 12 engines for the Chicago, Burlington & Quincy, and have a number of other orders on hand.

The Rogers Locomotive Works, at Paterson, N. J., are to build one or two locomotives of the Fontaine pattern for the Fontaine Engine Co., of Detroit.

## Car Notes.

The American Palace Sleeping Car Co. filed notice of incorporation at Albany, N. Y., July 22. The object for which it is formed is to carry on the general business of building, manufacturing, owning, furnishing, letting, selling and maintaining locomotive engines, cars, rolling stock, etc. The capital stock is \$10,000,000, divided into 100,000 shares of \$100 each. The company is to continue in existence 50 years, and is to be managed by a board of 13 directors. The business is to be carried on in New York City. Adam H. Ward, Aaron H. Cragin, and others are the incorporators.

The first shipment of cars from the new works at Youngstown, O., was made July 19, and was part of an order of 52 cars for the Alliance & Lake Erie narrow-gauge. The company is also engaged in filling an order of 18 open-bottom coal cars for the Castle Shannon Coal Company near Pittsburgh. Between 75 and 80 men are now employed at the works, and as soon as all necessary machinery can be placed in position and the works set to running full blast, 150 men will be employed.

The Indianapolis & St. Louis shops at Mattoon, Ill., have just completed a special car for the General Superintendent of the road. It was designed by Master Car-Builder G. H. Pratt, is handsomely finished and contains an office and sleeping room, dining room and kitchen, with all necessary conveniences.

The iron works of John L. Gill, at Columbus, O., have a contract for 200 flat cars for the East Tennessee, Virginia & Georgia road.

## Bridge Notes.

The Leighton Bridge & Iron Works, at Rochester, N. Y., have been leased for a term of years to John F. Alden and Moritz Lassig, who will conduct the business. The firm of Alden & Lassig, in addition to the office at the works in Rochester, will have an office at 705 and 707 South Clark street, in Chicago. Mr. Alden has been with the Leighton works for ten years as Engineer.

The Philadelphia Bridge Works of Crofode & Saylor, at Pottstown, Pa., are making the iron work for the new Pennsylvania depot in Philadelphia, and an iron bridge over the Schuylkill River for the New Orleans Pacific road.

Rust & Coolidge, of Chicago, are building a new iron bridge of three spans, one of 174 ft. and two of 150 ft. each, over the Meramec River, for the St. Louis, Iron Mountain & Southern road; also six spans of iron bridge on the Arkansas Division of the same road.

The Iron City Bridge Works in Pittsburgh are building a number of Greenleaf turntables; also the approaches to the new bridge over the Monongahela in Pittsburgh.

The Toronto (Ont.) Bridge Co. has the contract for a bridge over the Assiniboine River on the Canadian Pacific.

The Cleveland Bridge & Car Works are building a bridge over the Red River in Manitoba.

## Iron and Manufacturing Notes.

The firm of H. S. Manning & Co., dealers in railroad supplies at No. 111 Liberty street, New York, has been increased by the admission of Mr. Charles A. Moore, of the Ashcroft Manufacturing Co., and will hereafter be Manning, Maxwell & Moore.

Rising Fawn Furnace in Dade County, Ga., has been sold to a new corporation known as the Walker Coal & Iron Co., of which Col. Warner is President and Hon. Joseph E. Brown Vice-President. The price paid was \$25,000. The furnace has lately been repaired and put into good order. It will soon go into blast.

Tecumseh Furnace, at Tecumseh, Ala., has, according to the Chattanooga Times, entered on its seventh year of blast on the same hearth, without blowing out. The furnace is 60 ft. high and 12 ft. bosh, uses charcoal for fuel and brown hematite ore.

The Interlocking Switch & Signal Co. having been consolidated with the Union Electric Signal Co., as heretofore noted, the works have been removed to Pittsburgh.

Clipper Gap Furnace, at Clipper Gap, Cal., is now running steadily and is shipping iron to San Francisco. The furnace is making 25 tons a day.

The works of the Washburn Iron Co. in Worcester, Mass., are closed for repairs until Oct. 1.

The Philadelphia & Reading Rolling Mill in Reading, Pa., has started up again after a stop for repairs.

Brown, Bonnell & Co., in Youngstown, O., are building a new rolling mill on land lately bought for that purpose.

The Scottdale (Pa.) Rolling Mill is running full time and will make no stop for the hot weather.

Charlotte Furnace, near Scottdale, Pa., is in full blast and not likely to stop for some time.

The Bethlehem Iron Co., at Bethlehem, Pa., is to furnish 15,000 tons of steel rails for the extension of the East Tennessee, Virginia & Georgia road.

The Diamond State Iron Works, at Wilmington, Del., have a contract for a large quantity of fish-plates, nuts and spikes for the same road.

## The Rail Market.

Steel rails are more active and several large transactions have been made for 1882 delivery at \$55 to \$56 per ton at mill. Rails for immediate delivery are hard to find and \$60 to \$62 per ton has been paid. English steel rails are offered at \$58 to \$60 at tide.

Iron rails are also very active and many sales are reported.



Prices range from \$46.50 per ton at mill for heavy rails up to \$52.50 for light sections. English rails are lower, with few sales reported.

Old iron rails are quoted at \$26 to \$28 per ton in Philadelphia, with few sales.

#### British Rail Exports.

For the month of June and the six months ending with June the exports of steel and iron rails to United States from Great Britain are reported as follows by the Board of Trade, in tons:

	1881.	1880.	1879.
June:			
Iron rails.....	10,616	17,572	.....
Steel rails.....	21,082	16,342	4,831

Total.....	31,698	33,914	4,831
Six months:			
Iron rails.....	65,085	62,071	301
Steel rails.....	92,746	63,907	7,420

Total.....	157,831	126,578	7,730
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The very large decrease in the exports of iron rails to this country in June is not quite made up by the large increase (29 per cent.) in the steel rail exports, so that there is a decrease of 6% per cent. in the total.

For the six months, however, there is an increase in both iron and steel, of 4 per cent. in iron and 45 per cent. in steel, making 26 per cent. in the total rail exports to this country.

The total British exports to all countries in these periods were:

	1881.	1880.	1879.
June:			
Iron rails.....	13,254	25,417	1,264
Steel rails.....	69,527	66,582	33,680

Total.....	82,781	91,999	34,953
Six months:			
Iron rails.....	73,427	83,781	19,288
Steel rails.....	267,387	233,559	151,769

Total.....	340,814	317,340	171,027
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The total exports this year were sufficient for 3,872 miles of track. The United States took 41% per cent. of the whole only in 1879, 40 per cent. in 1880, and 45 per cent. in 1881.

#### English Blast Furnaces.

According to a statement prepared by Ryland's Iron Trade Circular there were in Great Britain on June 30 last 951 blast furnaces, of which 542 were then in blast. During the quarter ending June 30 last 44 furnaces went out of blast and 11 were blown in, making a net decrease of 33, which was entirely in the Midland and Welsh districts. During the quarter one new furnace was completed and three old ones pulled down. Eight new furnaces are under construction.

#### A New Railroad Crossing.

Mr. A. Babcock, Road-Master of the Morris & Essex Division of the Delaware, Lackawanna & Western road, has had built at the Dover shop and put in at the crossing of the old road and Boonton Branch at Denville, N. J., a crossing of a new pattern. It is built of 4 1/2" Scranton steel rails braced and bolted at the inside angles with heavy castings. Mr. Babcock believes the design entirely new and original with himself, having never seen one like it in a wide experience, and also believes that it is a very safe and durable crossing. It will have a severe test, having to carry a heavy traffic.

#### Couldn't Remember the Cage.

"Porter," said the gentleman from New York, as he stepped into his berth, "take this quarter and call me at Lyons, sure." "All right, sah." Late next morning he calls him: "Only twenty minutes from Buffalo, sah." The passenger makes a chapter of remarks in blanks and dashes, winding up with "Why in fury didn't you call me at Lyons?" New porter, ecstatically, "Lions!" "For goodness, dat's it! You did say lions, for suah, boss, and I done thought ober de whole circus, an' I hope to die ef I could ketch onto any animile higher dan buffalo! I'll remember de cage next time, boss." The passenger from New York is not appeased, but all the other passengers are, most mightily.—*Burlington Hawkeye.*

#### How a Widow Returned a Kindness.

Yesterday Mrs. Patience Beckett, the widow of Thomas Beckett, the engineer of the Baltimore & Ohio Railroad who died July 3, received from the Baltimore & Ohio Relief Association, of which he was a member, a check for \$2,092. Thomas Beckett, or, as he was familiarly called "Tommy," was one of the institutions of the company. Entering its service in 1834, nearly half a century ago, as a teamster, he rose gradually to the position of an engineer, which he held for 35 years. Possessed of but limited education, his wonderful powers of memory enabled him to retain accurately all instructions when once read to him. He never cost the company a dollar arising from any claim for damages. Many interesting incidents could be told which happened during his long service with the company. The following is illustrative of his generosity and kind heartedness: Many years ago the engine of the mail train on the Baltimore & Ohio Railroad bound west to Cumberland, of which Beckett was the engineer, and the late George A. Rawlins, conductor, when near Doe Gully tunnel struck and killed a cow belonging to the widow of a watchman at that point who had lost his life in the service. The accident brought to the scene many persons, including the widow and her children, who were crying most piteously at their loss. Beckett and Rawlins headed a subscription, took it around among the passengers and train hands, and soon succeeded in collecting \$70, which they handed to the widow. Turning to Beckett and Rawlins, she said: "You will never regret this kindness to the widow and her children, and it will come home to you some day. Several years passed, and the incident was forgotten, when one night Beckett left Cumberland on his east-bound trip in a terrible rainstorm, and, after passing Doe Gully tunnel, noticed a large bonfire some distance ahead. He quickly blew for brakes, and succeeded in bringing his engine to a stand, within 50 feet of an immense land-slide, covering the track for a distance of 150 feet. Ahead of the slide the widow had built the fire. She came running to the engine, and exclaimed: "I told you you would never regret your kindness. I heard the fall of the rock and earth in the cut, and I knew you were coming down, and I built the fire to warn you of the danger. God bless this man, who thought of the poor widow and her children when they were in trouble!" This act of the widow saved the lives of the passengers and trainmen, and to the day of his death "Tommy" Beckett never tired of talking of the widow who signaled him at Doe Gully tunnel.—*Baltimore American*, July 21.

#### Would be a Good Conductor.

Among the many pranks of the lightning during the storm of yesterday afternoon it is reported that a citizen, whose name it is unnecessary to mention, was standing on the Allegheny Railroad track, on the Basin, with his umbrella raised, when that tremendous flash came, was suddenly made aware of the fact that the rain was pitilessly pelting him. Looking upward he found that the point of his umbrella had a blue streak upon it, one of the steel ribs

was melted and the whole top of his rain protector burned. Persons at some distance who chanced to be looking in that direction distinctly saw the flash and were sure the gentleman was killed, until they saw him quietly lower his wreck and scot for the nearest shelter. The gentleman should at once apply to the Allegheny Railroad Company for the position of conductor.—*Richmond (Va.) State.*

#### OLD AND NEW ROADS.

**Belt Line, of Chicago.**—This company has filed articles of incorporation in Illinois to build a railroad from a point on Lake Michigan at or near South Chicago, running thence to a point on the Chicago, Burlington & Quincy in the town of Cicero, thence to the south line of the town of Jefferson, thence to the Chicago & Northwestern tracks near their intersection with the northern limits of Lake View, and thence east to Lake Michigan. The incorporators are Albert Keep, Marvin Huggitt, Thomas J. Potter and William K. Ackerman, Chicago; Charles E. Perkins, Burlington; Henry B. Ledyard, Detroit; A. L. Osborne, La Porte, Ind., and Elijah Smith, Boston.

**Blairtown.**—It is reported that this road has been sold to the New York, Susquehanna & Western, and will be used as part of the extension to the Water Gap. The road is 11 miles long, from Blairtown, N. J., down the Paulinskill to Delaware station on the Delaware, Lackawanna & Western. It has been almost entirely owned by Mr. John I. Blair, who lives at Blairtown.

**Brunswick & Albany.**—It is stated that a plan of reorganization has been completed by which the company is to issue \$2,000,000 first-mortgage bonds and \$3,500,000 preferred stock. Holders of the Frankfort committee's certificates and other owners of the \$2,500,000 old first-mortgage bonds will be entitled to a *pro rata* share in \$300,000 cash, \$1,250,000 first-mortgage 40-year 6 per cent. bonds and \$1,600,000 of preferred stock. The balance of the new securities will be used for the extension of the road.

**Burlington & Missouri River in Nebraska.**—The short link between Endicott, Neb., and Wymore, which was needed to complete the connection of the Eastern Division of the Republican Valley line with the Beatrice Branch, has been completed, and the line is now open for business. The connection was about 11 miles long, and makes the Eastern Republican Valley Division 102 miles long, from Amboy to Beatrice.

**Cairo & Vincennes.**—It is announced in London (where the securities are chiefly held) that an agreement has been concluded for the sale of this road to the Wabash, St. Louis & Pacific Company. The plan includes the purchase also of the Danville & Southwestern and the St. Francisville & Lawrenceville roads, which, with this road, form a line from Danville, Ill., to Cairo, with a spur to Vincennes, Ind., about 270 miles in all. This line will be known as the Cairo Division of the Wabash, and that company will issue \$3,857,000 in new 5 per cent. bonds, having 50 years to run, and secured by a first mortgage on the division. Holders of Cairo & Vincennes securities are to receive these new bonds in exchange for their preferred stock, one \$1,000 bond for each 10 shares, and for the common stock they will receive Wabash, St. Louis & Pacific common stock, share for share. Stockholders are required to send in their certificates and proxies by Aug. 1 to J. S. Morgan & Co., London, or Drexel, Morgan & Co., New York.

The Cairo & Vincennes Company has \$2,000,000 preferred and \$3,500,000 common stock. There is now no bonded debt upon the road.

**California Central.**—Articles of incorporation have been filed for the California Central, San Joaquin & Mountain Division. The proposed line is from McBride's Pass on the Nevada state line west to Santa Cruz, where connection will be made with the projected San Francisco & Ocean Shore road. From McBride's Pass another organization is to extend the line to the Farnham Valley in Nevada.

**Canadian Pacific.**—A dispatch from Montreal, July 19, says: "At a meeting of the directors of the Canadian Pacific Railway Company, held at their head offices here, it was resolved to issue land grant bonds to the extent of \$25,000,000, in accordance with the charter. The bonds will be negotiated through the Bank of Montreal, Morton, Rose & Co., of London, and by Reinach & Co., of Paris and Berlin. The whole amount will not be issued at once."

**Chicago, Burlington & Quincy.**—After the great wash-outs which interrupted traffic on the Rock Island and Northwestern roads in Iowa, this road carried a great deal of passenger and freight traffic for them for about ten days, while repairs were being made.

Week before last the road received two consolidation locomotives from the Baldwin Works, which will be followed by four more; also four eight-wheel engines from the Manchester Works, the first of an order for twelve.

It is stated that this company has decided to build the proposed Osceola & Des Moines line, from Osceola, Ia., on its main line, nearly due north to Des Moines, a distance of 39 miles.

**Chicago & Iowa.**—The stock of the city of Aurora in this road, amounting to 1,000 shares, for which it paid its bonds when the road was built, and which it has claimed to be the only valid stock in the company, being the only stock for which money or value was paid, was sold at auction July 23. The upset price was \$130,000, which was bid by L. O. Goddard, in behalf of the Chicago, Burlington & Quincy; \$100 more was bid by F. E. Hinckley, who built the road; and then the stock was sold for \$130,200 to Charles C. Jackson, of New York. It is rumored that he represents both the Chicago, Burlington & Quincy and Mr. Hinckley, and that they have agreed upon the disposition of the road.

**Chicago, Milwaukee & St. Paul.**—The directors last week voted to issue the \$5,000,000 new common stock authorized by vote of the stockholders. It will be offered first at par to present stockholders, who will have the option of taking their *pro rata* share up to Oct. 15. The proceeds are to be used for new equipment, improvements and extensions.

It is reported that the company will also soon issue \$7,000,000 new bonds for the purchase and construction of new lines. The report has not yet been confirmed.

A contract for the construction of a new branch from Hastings, Minn., north to Stillwater, about 23 miles, has been let to Wells, Harrison & Shute, of Milwaukee. The object of the branch is to secure a direct connection with the large lumber mills at Stillwater.

Wells, Harrison & Shute have also the contract for the Chippewa Valley line in Wisconsin, from Eau Claire to the Mississippi. It is not yet settled whether the river terminus is to be at Wabasha or on the Wisconsin side of the river.

**Chicago & Northwestern.**—A contract for the extension of the Winona & St. Peter line from Watertown, Dak., west to the centre of Clark County, 80 miles, has been let to L. G. & N. Graham, who are to have the grading done in October.

Work on the Volga Branch in Dakota has been delayed by high water and wet weather. On the James River Branch, track has been laid from Huron, Dak., on the Dakota Central line, northward up the valley of the James for 28 miles.

**Chicago, Pekin & Southwestern.**—Receiver Reed has filed the following statement with the Court for five months ending June 30:

Balance, Feb. 1.....	\$12,332.27
February receipts.....	34,321.54
March ".....	46,074.13
April ".....	39,461.06
May ".....	29,097.01
June ".....	39,915.90

Total.....	\$201,801.91
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February disbursements.....	\$38,673.97
March ".....	47,803.65
April ".....	38,769.86
May ".....	32,319.55
June ".....	38,849.78

Total.....	194,416.51
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Balance, July 1.....\$7,385.40  
The disbursements were greater by \$4,946.87 than the receipts for the five months.

**Chicago & West Michigan.**—Agreements have been completed for the consolidation with this company of the Grand Rapids, Newaygo & Lake Shore, the Grand Haven and the Michigan & Indiana companies. The stock of the first two companies was purchased by this company a short time since. The Michigan & Indiana is the company organized to extend the road from New Buffalo southward.

**Cincinnati, Indianapolis, St. Louis & Chicago.**—In Indianapolis, July 27, suit was begun by John T. Baker, on behalf of certain stockholders of the old Indianapolis, Cincinnati & LaFayette Company, to review and set aside the foreclosure and sale under which the road passed to the present company.

**Cleveland, Columbus, Cincinnati & Indianapolis and the Cincinnati, Hamilton & Dayton.**—By the consolidation agreement of these companies, the authorized capital stock of the new company, to be known as the Ohio Railway Company, will be \$20,000,000. One of the articles of agreement provides as follows: "Eighteen million five hundred thousand dollars only of said stock shall be issued forthwith after such consolidation shall be perfected. The remaining shares of said capital stock over and above said \$18,500,000, or any portion thereof, shall not be issued until authorized by a two-thirds vote of the directors of said consolidated company present at any regular or called meeting thereof. The \$18,500,000 stock of said new company shall be issued in exchange for an equal amount of stock in the above-named companies, parties hereto, upon the surrender and cancellation of such stock in either or both of the companies parties to this agreement; and the board of directors shall have full power and authority to fully carry into effect this consolidation agreement; to settle, compromise, or otherwise adjust all claims of stockholders in either of said companies parties hereto; to sell and dispose of such stock, if any, in the company, as may be necessary for them to settle, compromise, purchase or otherwise cancel the stock of any stockholder or stockholders in either of said companies who may dissent from or refuse to acquiesce in this agreement, and to exchange his stock in either of said old companies for stock in said new company."

**Continental.**—This company having made a show of beginning work by driving piles in the Hudson and Hackensack rivers, the Attorney General of New Jersey has begun proceedings to enjoin the work, on the grounds that the company has taken no steps to secure title to the land under water, which belongs to the state; that the company is not a lawful corporation, having failed to comply with the state law under which it claims to exist; that the survey of the route has not been filed as required by law, and that generally it has no legal office or existence in the state. The Court of Chancery has granted a temporary injunction and order to show cause why it should not be made permanent.

**Danville, Mockville & Southwestern.**—There are now seven miles of this road graded. Tracklaying will be begun as soon as the Danville & New River road reaches Cascade Junction, from which point to Danville, Va., the track is to be used in common.

**Detroit, Warsaw & Western.**—This company has filed articles of incorporation in Illinois to build a railroad from the Mississippi, near Quincy, east by north across the state to the Indiana line in Iroquois County.

**Eastern.**—The Chelsea Beach road, worked by this company, is now completed and in operation. It leaves the main line at Oak Island station, eight miles from Boston, and runs along Chelsea Beach, connecting with the Eastern road again at Saugus River, one mile west of West Lynn. It is two miles long, and has been built to secure a share of the travel to the beach.

**East Tennessee, Virginia & Georgia.**—At the special meeting in Knoxville, Tenn., July 20, resolutions were offered and were adopted by the stockholders, approving and confirming the previous actions of the board of directors in the purchase of the Knoxville & Ohio Railroad, the Macon & Brunswick Railroad and the Alabama Central Railroad; also the action of the board of directors in contracting to finish the Knoxville & Ohio Railroad to the Kentucky state line, and the contract for the extension of the Macon & Brunswick road through Atlanta to Rome, was confirmed; also the action of the board of directors in provisions made for completing and equipping all these lines and purchasing machinery for the main line, and the increase of securities and their distribution.

A resolution was adopted providing that hereafter only *bona fide* stockholders should be passed free on the road to attend meetings of the company.

After a session of about 20 minutes, the meeting of stockholders adjourned until Sept. 2.

By this action the large increase of securities lately proposed is ratified. The company's stock is now fixed at \$18,500,000 preferred and \$27,500,000 common. The bonded debt authorized consists of \$22,000,000 consolidated mortgage 5 per cent. bonds, and \$16,500,000 income 6 per cent. bonds.

The Company last week offered to pay down to the state of Georgia the balance of \$875,000 due on the purchase of the Macon & Brunswick road, which by the terms of the purchase had over four years to run yet. The payment was to be made in United States 4 per cent. bonds, and was somewhat delayed by the refusal of the state authorities to receive extended 3 1/2 per cents, or to receive Georgia state bonds at their market value. Payment was at first offered in state bonds, but the State Treasurer held that he could take them only at face value, and not at their market value, now about 112.

The contracts for the extension of the Macon & Brunswick road from Macon to Atlanta have all been let. The contractors are Condon & Co., W. D. Grant, Patrick Lynch and J. W. Renfro. Surveys are being made for the line from Atlanta to Rome, and contracts are soon to be let. The rails



and fastenings have been bought, and contracts for a large number of ties let. The whole length of the extension to be built from Macon by Atlanta to Rome is 174 miles.

**Evansville & Terre Haute.**—The transfer of the control of this company to the Chicago & Eastern Illinois has been completed. It is reported that that company now owns four-tenths of the stock and the Louisville & Nashville four-tenths, the last-named stock not being owned by the company directly, but by some of its officers. The remaining two-tenths are held by Mr. D. J. Mackey and others, of Evansville.

Work is to be begun very soon on the connection from Evansville, Ind., to Henderson, Ky., including the bridge over the Ohio River.

**Georgia Pacific.**—The contract for building this road from Atlanta, Ga., to the Mississippi has been let to a construction company known as the Richmond & Danville Extension Company, of which Gen. T. M. Logan, of Richmond, Va., is President, and Major Johnson Manager. Work is to be begun at once.

**Gulf & Tennessee River.**—This company has been incorporated to build a railroad from Tuscaloosa, Ala., north to some point on the Tennessee River not yet decided on. It will be about 120 miles long, through a country rich in coal and other minerals.

**Illinois Midland.**—A dispatch from Springfield, Ill., July 23, says: "In the suit of John J. Waterbury, of New York, against the Illinois Midland Company and others, an order for judgment against the defendants was entered to-day in the United States Circuit Court. This is one of several actions brought by Joseph L. Hance, counsel for several bankers, who hold all the stock of the old Paris & Decatur Railway Company—a part of the consolidation under the name of the Illinois Midland Railway Company—and who seek to regain possession of that road and operate it separately; and the complainant asked that the conveyance of the Paris & Decatur Railway Company to the consolidated company be set aside on account of fraud, and also that the Illinois Midland Railway Company's mortgage of \$4,175,000 be canceled of record so far as it affects the Paris & Decatur Railway. The effect of the order of the Court is to break up the Illinois Midland consolidation, which has hitherto been composed of the Paris & Decatur, the Paris & Terre Haute, and the Peoria, Atlanta & Decatur railroads, running a distance of 175 miles, from Terre Haute, Ind., to Peoria, Ill."

**International & Great Northern.**—Work is progressing steadily on the extension from San Antonio to the Rio Grande, and the grading is finished to within 15 miles of Laredo. A line is being run on the Mexican side of the Rio Grande from Laredo to Mier.

**Jacksonville, Pensacola & Mobile.**—As heretofore noted, the sale of this road to the Dutch bondholders, made Sept. 23, 1879, has been finally approved by the United States Circuit Court, under decree of the Supreme Court. The long and intricate litigation over the road is now probably ended, and the property passes into the possession of the purchasers, who will organize a new company and try to work the road to the best advantage.

**Jacksonville & St. Augustine.**—A contract for the building of this road has been let to W. J. Lawton, of Jacksonville, Fla., who begins work at once. The line is from the St. Johns River opposite Jacksonville, Fla., south by east to St. Augustine, about 35 miles.

**Kentucky Central.**—This company, by its President, M. E. Ingalls, has filed a mortgage deed to George T. Bliss and Isaac E. Gates, conveying to them in trust the main line from Covington to Lexington, and the line from Lexington to Livingston, now in process of building, with all the machine shops, water stations, machinery, engines, tenders, and all other rolling stock whatsoever, and all franchises, privileges, etc., to secure the payment and extinguishment of bonds of the Covington & Lexington Company, due March, 1883, and June, 1885, amounting to \$1,010,000, for the payment of 5,000 shares of preferred stock, the extension of the road to Livingston, and the discharge of all existing contracts and debts—for which purposes the borrowing of money was necessary. The mortgage is for \$6,100,000, and bonds amounting to 6,100 for \$1,000 each are to be issued to Messrs. Bliss and Gates, bearing date July 1, 1881, and payable in 1911. The interest is at 6 per cent., payable semi-annually, in January and July, at New York.

**Lehigh Valley.**—Work will soon be begun on a short branch from Landsdown, N. J., on the New Jersey Division, to the town of Clinton. It will be two miles long. It is reported that this company will build an extension from New Boston by St. Clair to Pottsville, about eight miles. Some heavy work will be required.

**Lycorning, Sullivan & Bradford.**—It is proposed to organize this company to build a railroad from Muncy, Pa., to Laporte in Sullivan County, and thence north into the coal fields of Bradford County. The old Muncy Creek will be used as part of the new line.

**Madison, Monroe & Freeport.**—This company has filed articles of incorporation to build a railroad from Madison, Wis., by Monroe to Freeport, Ill., about 70 miles. The incorporators are Charles B. Jennings, Frank F. Fowler, George V. Moreley and Albert L. Rice, New York; Joel Perham and Russell C. Elliott, Boston; H. W. Whitney, John Luchsinger, Benjamin Chenoweth, A. C. Dodge and John Bolender, Monroe.

**Manhattan Elevated.**—The New York Elevated company has procured from the New York Supreme Court an order to show cause why its road should not be returned to it on account of the failure of the Manhattan Company to comply with the terms of the lease. The case will be heard Aug. 11.

**Marquette, Houghton & Ontonagon.**—Sealed proposals will be received until noon of Aug. 6, at the office of the Farmer's Loan & Trust Company, trustee, No. 26 Exchange place, New York, for the sale to said trustee of \$1,750,000 of the bonds issued by this company under the mortgage of March 1, 1878.

**Meadville.**—Work on this road has been delayed by the difficulty of securing laborers. Nearly all the grading is now done except two cuttings, and those are well advanced. Track has been laid to Linesville, Pa., on the Erie & Pittsburgh road, eastward to Burchard's Mill, 11 miles, and the ballasting is done to Evansburg, seven miles. About six miles remain to reach Meadville.

**Memphis, Selma & Brunswick.**—This company has been organized to hold and work the extension of the Brunswick & Albany road across Alabama, which is to be built by the Alabama Great Southern syndicate. The company has bought the Selma & Greensboro road (part of the old Selma, Marion & Memphis), which is running to Greensboro, Ala., 44 miles from Selma. It had previously bought the franchises and partly graded road-bed on the Memphis end of the road. It is said that the line will be pushed through to Memphis.

### Mexican Oriental, Interoceanic & International.

This company has filed articles of incorporation under the laws of New York. The articles state that on June 7, 1881, a contract was entered into by and between the republic of Mexico and the International Railway Improvement Company granting certain rights and powers, with a subsidy in aid of the construction and operation of a railroad and telegraph and branches within the republic, and the contract provided that said rights and powers could be transferred to one or more companies which might be organized for that purpose. The International Railway Improvement Company does not contemplate the permanent maintenance and operation of a railroad and telegraph, as by the contract required, but only the construction of the same for other companies or individuals; and the state of New York, having expressly authorized the incorporation of companies for the permanent maintenance of railroads and telegraphs beyond the limits of the United States, Jay Gould, Russell Sage, Sidney Dillon, Norvin Green, John F. Dillon, Thomas T. Eckert, M. Dodge, of New York; Ulysses S. Grant and Francis de Gress, of the City of Mexico, with others, have formed the above-named company. The company is to continue for a period of 99 years from date. The road is to begin at a point on the Rio Grande between Laredo and Reynosa, continuing south between longitude 1° west and 2° east of the meridian of Mexico, touching at San Fernando and Santander, joining with a branch road from thence to Ciudad Victoria, to be extended as far as San Luis Potosi; also, branches to Matamoros and the bar of Jesus Maria. In case this port should be opened to coasting and foreign trade, the trunk line shall continue from Santander Zimenez to the City of Mexico, by the most convenient ascent to the tablelands, and may continue from there to a point on the Pacific coast situated between the meridians 0° and 6° west longitude of the capital of the republic. The main line may divide or branch off before its ascent to the tablelands, passing by Papantla and Minatitlan, with its terminus in Vera Cruz, with branch roads to Sota La Marina, Tampico, Tuxpan and Feoluthnar Nautla. The amount of capital stock is placed at \$25,000,000, divided into 250,000 shares of \$100 each.

**Morris, Rockford & Northern.**—This company has been organized to build a railroad from Braceville, Grundy County, Ill., by Morris to Rockford. The object is to carry coal from the Braidwood district to the Northwestern road at Rockford. The office is at Morris, Ill.

**New Haven & Northampton.**—The long controversy over the Plantsville depot question, which was finally carried up to the United States Supreme Court and decided against the company, has broken out again. The Connecticut Railroad Commissioners ordered the company to stop all regular trains at Plantsville, and their authority was sustained. Now, however, the company has begun to run several trains past the place without stopping, claiming that they are not regular but express trains. The people are indignant and mean to see that the order is obeyed.

**New Orleans, Little Rock & St. Louis.**—This company has been revived, and an effort is to be made to secure its construction from Little Rock, Ark., to Shreveport, La. The line was surveyed several years ago and the right of way secured.

**New York Central & Hudson River.**—This company has been negotiating for a large tract of land and water-front at Charlotte on Lake Ontario, to which place a branch runs from Rochester. The ostensible object is to secure dock accommodations for the increased business expected at Lake Ontario ports from the opening of the enlarged Welland Canal, but it is thought that another motive is to prevent the Rochester & Pittsburgh Company from securing the property.

**New York & Connecticut.**—A hearing was had on July 27 before the Connecticut Railroad Commission on the location of this road, which is intended to run from New Haven to New York. The hearing was not finished, but adjourned one week.

**New York & New England.**—On July 25 this company began to run regular trains over the extension from Waterbury, Conn., to Brewsters, N. Y., track on which has been laid for some time. This extension makes the main line 190 miles long from Boston. At present the trains are run to accommodate local business and no arrangements for through traffic have been made. Work is nearly finished on the connection with the New York City & Northern at Brewsters.

Work is progressing well on the extension from Brewsters to Hopewell Junction and the Hudson River.

**Norfolk & Western.**—It is stated that this company has decided to build a branch from Big Lick, Va., southward about 30 miles to Rocky Mount. The object is to secure traffic from the valuable ore fields of Franklin County, which yield a very fine quality of ore suited for the manufacture of Bessemer pig iron. These mines are now reached by a narrow-gauge branch of the Virginia Midland.

The name of Big Lick station, 257 miles from Norfolk, and the point of junction with the Shenandoah Valley Railroad, has been changed to Roanoke.

**Oley Valley.**—It is proposed to build a railroad from Monaca, Pa., on the Reading road, through the Oley Valley, a distance of 13 miles to Friedensburg. The line is through a rich country now some distance from railroad facilities.

**Ontario & Quebec.**—Instructions have been given to locate finally this line from Ottawa to Toronto, Ont. The preliminary surveys have been made.

**Pennsylvania.**—A branch is to be built from the Bellefonte & Snow Shoe Branch to some newly-developed coal mines in the Snow Shoe Region. It will be four miles long.

The company's statement for June shows for all lines east of Pittsburgh and Erie, as compared with June, 1880:

An increase in gross earnings of (18.2 per cent.).....\$585,961  
An increase in expenses of (4.9 per cent.).....109,665

Net increase (47.1 per cent.).....\$476,296

For the six months ending June 30, as compared with the corresponding period last year, the same lines show:

An increase in gross earnings of (10.9 per cent.).....\$2,119,709  
An increase in expenses of (10.7 per cent.).....1,217,022

Net increase (11.2 per cent.).....\$902,747

All lines west of Pittsburgh and Erie for the six months of 1881 show a surplus over liabilities of \$1,625,783, being a gain over the same period in 1880 of \$284,676.

**Pennsylvania & Martin's Creek.**—Surveys are being made for this road from a point on the Delaware River at the mouth of Martin's Creek in Northampton County, Pa., up the creek by Bangor and Pen Argyl to the Wind Gap, a distance of about 15 miles. Connection will be made across the Delaware with the Belvidere Division of the Pennsylvania Railroad. The road will reach extensive slate quarries.

**Pensacola & Atlantic.**—Contracts for grading this road from Pensacola, Fla., eastward 35 miles have been let to Warner, Tabler & Co., of Kentucky, and for the 25 miles from the Apalachicola River westward, to Howard, Walker & Co., of Gadsden County, Fla. Both contracts are to be completed by Dec. 1 next.

**Philadelphia & Reading.**—The following is the Receivers' statement for June and the seven months of the fiscal year from Dec. 1 to June 30, in the somewhat cumbersome form now used:

Railroad Co.:	June.		Seven months.
	Gross.	Net.	Net.
Railroad traffic.....	\$1,522,753.68	\$674,667.34	\$4,102,322.85
Canal traffic.....	124,052.58	73,281.82	101,836.75
Steam colliers.....	56,368.83	22,381.86	119,031.23
Richmond barges.....	4,120.58	1,864.48	967.84
Total.....	\$1,707,295.67	\$768,468.54	\$4,322,512.99
Coal & Iron Co.:			
Total receipts.....	1,143,609.78	70,831.92	366,018.64
Total, both Co.s.....	\$2,850,905.45	\$839,300.46	\$4,688,531.63

\*Loss.

Expenses, we believe, do not include interest or rentals, the net earnings given being the amount from which all charges are to be paid.

A comparison of net earnings is as follows:

Railroad Co.	June.		Seven months.
	1881.	1880.	1881.
Railroad.....	\$768,468.54	\$653,958.98	\$4,322,512.99
Coal & Iron Co.....	70,831.92	71,167.84	366,018.64
Total.....	\$839,300.46	\$725,126.82	\$4,688,531.63

\*Loss.

For the month the increase for the railroad company was \$114,509.56 or 17.5 per cent., and for both companies \$114,173.64, or 15.7 per cent. In the seven months the railroad company gained \$129,493.18, or 3.1 per cent., the total gain for both companies being \$588,542.99, or 14.8 per cent. The reduction in the Coal & Iron Company's expenses was proportionately large.

In traffic the statement is as follows:

Passengers carried.....	June.		Seven months.
	1881.	1880.	1881.
Passengers carried.....	909,167	808,390	5,583,003
Tons merchandise.....	558,106	476,442	3,517,360
Tons coal.....	690,613	559,704	3,539,700
Tons coal on colliers.....	55,454	38,489	4,080,461
Tons coal mined.....			302,339
By Coal & Iron Co.....	350,404	266,599	1,852,621
By tenants.....	121,298	95,038	781,776
Total.....	471,692	361,627	1,634,397

The increase in traffic and in coal mined is less than might fairly have been expected from indications and from the talk some of the friends of the company have indulged in.

**Raleigh & Seaboard.**—This project has been revived and efforts are being made to secure subscriptions. The line is from Raleigh, N. C., by Tarboro to Williamston on the Roanoke, about 85 miles. Some 35 miles of the line were graded and six miles of track laid several years ago by the Williamston & Tarboro Company.

**Rhinebeck & Connecticut.**—A suit has been begun to foreclose the first mortgage of \$800,000 on this road. The road extends from Rhinecliff, N. Y., on the Hudson, to a connection with the Connecticut Western at State Line, 42 miles. It has earned very little over its running expenses.

**Richmond & Allegheny.**—Work has been begun on the tracklaying of the branch to Lexington, Va., which leaves the main line at the mouth of North River and will follow up the branch canal to Lexington.

**Richmond & Danville.**—The Richmond (Va.) State says that the members of the Richmond & Danville syndicate, holding 26,624 shares of the stock, have formed a pool to last for a period of 10 years. The stock will be assigned to a committee composed of the following gentlemen: T. M. Logan, Joseph Bryan, John P. Branch, William H. Palmer and James H. Dooley, of Richmond, and William P. Clyde, and G. W. Perkins of New York. The stock will be deposited with the Central Trust Company, of New York, which company will issue pool certificates therefor to the parties entitled to them. The pooled shares represent a control of the entire Piedmont and coast system of the Richmond & Danville Company, and the pool arrangement is intended to prevent any transfer of the control.

**St. Louis, Ft. Smith & Southern.**—This company has been organized to build the extension of the St. Louis & San Francisco road from Ft. Smith, Ark., southward to Texarkana. The capital stock is to be \$2,500,000.

**Susquehanna, Pittsburgh & Western.**—This company has filed articles of incorporation to build a railroad from Pittsburgh, Pa., to Milton, on the Catawissa Branch of the Reading road. The distance is 225 miles, and the capital stock is \$5,625,000. The corporators are all connected with the New York, Pittsburgh & Chicago project.

**Sussex.**—The following statement as to the sale of this road is from a letter from Mr. John I. Blair to Superintendent E. C. Case: "I herewith inform you that we have this day sold the control of the Sussex Railroad. That portion of the road north of Hamburg Junction (3½ miles) we sold to the Lehigh & Hudson Railroad Company; the other portion will pass under the control of the Delaware, Lackawanna & Western Railroad Company. In this sale we have provided that our stockholders shall share equally alike. Circulars will be sent to all our stockholders explaining the terms. Dividends will be made in cash to each stockholder so as to close up all within 60 days."

The daily papers and dispatches have given a good deal of unnecessary importance to the sale of this road. It is a short local road having a light passenger traffic and a considerable business in milk and iron ore and (when the furnaces at the upper end of road are in blast) in coal. As a matter of fact the transfer will make very little difference in the relations of the road. A controlling interest has always been held by directors of the Delaware, Lackawanna & Western Company, and the sale simply puts this control in the hands of the company instead of some of its directors.

**Tarrytown & Portchester.**—It is proposed to build a railroad from Tarrytown, N. Y., on the Hudson River, southeast by White Plains to Portchester on the New York, New Haven & Hartford road. The distance is about 18 miles.

**Texas-Mexican.**—Articles lately filed by this company with the Secretary of State of Texas provide for an extensive system of branches and extensions, including the following lines: From Pena, Duval County, to El Paso de los Arrieros in Starr County, 65 miles; from Corpus Christi to Aransas Pass, with a spur to Rockport, 35 miles; from near San Diego to Burr's Ferry in Newton County, 390 miles; from Beeville by San Antonio to Fredericksburg in Gillespie County, 140 miles; from near Beeville to Rockport in San Patricio County, 45 miles; from a point on the Brazos at the



